TOPIC-NEUTRAL EXPRESSIONS

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ABSTRACT

The point of this thesis is to try to make some sense of the fact that a list formed with "or" has different distributive properties in different contexts. The sentence

(a) Mary is betrothed to Tom or Dick or Harry

is equivalent to the disjunction of the results of attaching "Mary is betrothed to" to "Tom", "Dick" and "Harry".

The sentence

(b) Mary is more anxious to marry than Tom or Dick or Harry

is equivalent to the conjunction of the results of attaching "Mary is more anxious to marry than" to "Tom", "Dick" and "Harry".

The sentence

(c) Mary wants to marry Tom or Dick or Harry

does not imply either the conjunction or the disjunction of the results of attaching "Mary wants to marry" to "Tom", "Dick" and "Harry".

In chapter two, in which conjunctively distributive "or" lists are discussed, I make the specific claim that the fact that in some contexts "or" lists are conjunctively distributive is related to the fact that

in some of these contexts, "and" lists are undistributive. The topic-neutral words "and" and "or", I claim, enable us to make more than one distinction. Implicit in this is the general claim that in order to understand the distinction between any pair of topic-neutral words, we must understand the distinctions that they enable us to make. When we examine the distinction between "any" and "every", we find that the difference between the logical roles of these words parallels the difference between the logical roles of "or" and "and" . It follows that "any" and "every" enable us to make more than one distinction. Involved in the acceptance of the view that the distinction between "or" and "and" and the difference between "any" and "every" is different in different contexts is the rejection of the view implicit in Professor Geach's account of the "any/every" distinction according to which the 'meaning' of a topic-neutral word can be given by a simple correlation between sentences containing that word and a single propositional form.

The sentence in which "or" lists are undistributive are sentences in which the distinction made by "and" and "or" is a distinction between satisfiability-conditions. This fact enables us to understand why certain forms of practical inference are valid.

Some sentences containing "or" lists, must, in order to be intelligible, be translated into sentences containing disjunctive propositional expressions. The equivalence of some "or" list-containing sentences to propositional conjunction can be explained in terms of this translation. But this does not provide an absolutely general way of explaining the distributional diversity of "or" lists. Some sentences containing "or" lists are not paraphrasable in this way, and in some which are, there is no rule in terms of which distribution over propositional disjunction can be justified. There is, however, a parallel distributional correlation between propositional disjunction and conjunction in sentences where distribution can be justified in terms of the truth-conditions of propositional disjunction and conjunction. This correlation provides a possible explanation of the occurrence of conjunctively distributive and undistributive "or" lists.

Errata

page 30 Sentence beginning on line 13 should read: "There is no normal use to which we can refer to show that the expression "the predication of 'f' of a_1 or a_2 or a_3" should be interpreted other than as being equivalent to "the predication of 'f' of a_1 or the predication of 'f' of a_2 or the predication of 'f' of a_3.""

page 239 Sentence beginning on line 10 should read: "But in the case of "S wants a_1 or a_2", there is no guarantee that the substitution for ϕ appropriate for "a_1" is the appropriate substitution for "a_2"."

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PREFACE

Professor Ryle has remarked that the distinction between philosophers and formal logicians is the distinction between explorers of the moors and operators of tramways. The present enterprise lies somewhere between the two. On the one hand, it is more an exploration than a predetermined excursion, but its subject-matter is more like a tramway than a moor. I am, I suppose, using "or" as a sort of road which is interesting both in itself and in the terrain through which it leads. The main findings of the exploration are, I think, that the sort of logical traffic that the road bears is determined by local economics, and that no point along it is entirely out of earshot of the trams. It has, I hope, also provided some close-up glimpses of areas of the linguistic countryside usually viewed in passing through the windows of first-class carriages.

I wish to express my gratitude to the Canada Council and the British Council who, as it were, financed the expedition. I am also grateful to Professor Bernard Williams for valuable criticisms and suggestions, and to the Editor of _Analysis_ for allowing me to re-print here the part of Chapter Two which

appeared in that Journal in June 1966.

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April 1967

INTRODUCTION

It has been a special concern of most writers of textbooks of symbolic logic to emphasize that the logical particles "&" and "v" differ in important respects from the English conjunctive words "and" and "or". Reference is usually made to the fact that whereas "&" and "v" of the propositional calculus connect only propositional expressions, the words "and" and "or" are capable of joining other parts of speech. Some textbook writers have even taken pains to show, particularly in the case of "and", that in English, it has non-propositional uses that are independent of its use as a propositional connecting word. But no textbook writer has given much attention to the grammarian's view that sentences in which the word "or" occurs between nouns or adjectives are elliptical for sentences in which "or" occurs between constituent sentences. And apart from the passing observation that in English, "and" and "or" sometimes join words and in logic "&" and "v" always join propositions, the subject of "and" and "or" as non-propositional connectives has not been touched in logic text-books. No logician, with the exception of Professor Peter Geach has given separate consideration to the logical behaviour of "and" and "or" as they occur more frequently in speech, joining non-propositional expressions.

The view that every sentence in which "or" occurs between nouns or adjectives is elliptical for a sentence in which "or" occurs between constituent sentences, and that every sentence in which "and" occurs between nouns or adjectives is elliptical for a sentence in which "and" occurs between constituent sentences is really the view that there is only one distributive procedure for any list formed with "or" and only one distributive procedure for any list formed with "and". I shall claim that the ellipsis view is false, and that the distributive possibilities of lists are as varied and, in some respects, as systematic as the distributive possibilities of disjunctive and conjunctive propositional expressions.

It is a fact of philosophic interest that the distributive properties of lists vary systematically in different sorts of contexts and that the distributional variations of "or" lists are generally correlated with variations in the distributive properties of "and" lists in a way rather like the way in which the distributive properties of propositional disjunction are correlated with variations in the distributive properties of propositional conjunction. But it is equally important to understand why, for a particular sort of context, the distributive properties of a list are what they are. A further question also arises: supposing that for a particular sort of context, a list has such and such distributive properties, what effect does this have upon the workings of the sorts of arguments in which sentences providing this sort of context characteristically appear as premisses? For example, if in the sentence "Mary wants cheddar or stilton", the expression "cheddar or stilton" is undistributive in respect of "Mary wants", then what effect does this have on the possibility of using the sentence "Mary wants cheddar or stilton" as a premiss in an argument leading to a decision to act.

In addition to exploring these considerations, I have tried to see what light, if any, the examination of the logic of lists formed with "and" and "or" sheds on the question of the relations between the so-called quantifier words "any", "every", "some" and "a", and the relations between distribution, scope and meaning.

CHAPTER ONE

1. Since the principle theme of this thesis will be the logical behaviour of lists, it will be advisable to say at the outset what I shall consider as counting as a list. I shall call a list any non-propositional expression consisting of more than one expression of the same grammatical type, which are separated by one of the connective words "and" and "or". I shall call the expressions separated by "and" or "or" the members of the list. The use that I will make of these terms is not a particularly technical use, except in the following respect. Where in English, commas would separate all but the last two members of the list, I shall write the list with all the member separated by the same connective word as separates the final two members. For example, where in English we might find the sentence "Mary invited Syd, Harry, Jill and Patricia", I shall write instead, "Mary invited Syd and Harry and Jill and Patricia". I shall, however, use the word context in a technical sense. Where a list occurs in a sentence, I shall call the rest of the sentence the context of the list.

At times, it will be convenient to have at hand a short-form for discussing sentences containing lists in general. I therefore introduce the following notation. "a_1", "a_2", "a_3",...; "b_1", "b_2", "b_3",...; "c_1", "c_2", "c_3",...; etc. represent nominal or other expressions which can be members of lists. Using miniscule letters with subscripts, separated by "and" or "or", I shall construct expressions representing lists. For the most part, only one miniscule letter will appear in any one list. Lists will be called "and" lists when they are constructed using "and", and "or" lists when they are constructed using "or". I shall say that a list of the form "a_1 or a_2 or a_3" is an "or"list of A's; a list of the form "b_1 and b_2 and b_3", I shall call an "and" list of B's. From time to time, I shall use suspension dots to indicate that the list being represented has more than the number of members represented by miniscules. The reasons for using the terms '"and" list' and '"or" list' rather than 'conjunctive list' and 'disjunctive list' will become clear later. The only other piece of notation which I want to introduce is as follows. "$\Lambda($ $)$" will represent the context of a list in the technical sense of "context" given above. I have chosen the character " " to suggest "τα λοιπα" meaning "the remaining part". The expression "$\Lambda(a_1$ and a_2 and $a_3)$" represents an "and" list occurring in a sentence.

I shall use the above notation to outline the project that I am undertaking and to make some relevant distinctions in order to exclude certain cases from consideration.

I want to talk about the relation between a sentence consisting of a list occurring in a context "$\wedge$( )" and a combination of sentences each of which consists of a member of the list occurring in a context having the same content as the context in which the list occurred in the original sentence. I shall call the move from a sentence of the former sort to a sentence of the latter sort the <u>distribution</u> of the context "$\wedge$( )" over the list. If a sentence consisting of a list of <u>n</u> members occurring in a context "$\wedge$( )" entails a conjunction of <u>n</u> sentences each of which consists of a (different) member of the list occurring in a context "$\wedge$( )", then the list will be said to be <u>conjunctively distributive</u> in respect of that context. If a sentence containing a list of <u>n</u> members occurring in a context "$\wedge$( )" entails a disjunction of sentences each of which consists of a (different) member of the list occurring in a context "$\wedge$( )", then the list will be said to be <u>disjunctively distributive</u> in respect of "$\wedge$( )".

It will be useful to distinguish further between those cases in which the original sentence is equivalent to a conjunction or to a disjunction of sentences, and those cases in which the original sentence merely entails the conjunction or disjunction of sentences. Some examples will serve to illustrate this distinction. The sentence

(1) Jennifer is heavier than Sally and Peter

is capable of two different interpretations: one according to which it means that Jennifer's weight exceeds the combined weights of Sally and Peter, and one according to which it does not mean this. But on either interpretation, (1) entails

(2) Jennifer is heavier than Sally and Jennifer is heavier than Peter

Interpreted in the latter fashion (1) simply means the same as (2), and interpreted as meaning that Jennifer is heavier than the other two put together, (1) entails (2), because of the nature of the relation _is heavier than_. But if (1) means "Jennifer's weight exceeds the sum of the weights of Sally and Peter", then although (1) entails (2), (2) does not entail (1). Where this is the case, I shall say that the list has an _undistributive sense_. When a list is neither conjunctively nor disjunctively distributive, I shall say that it is _undistributive_.

If the sentence

(3) Jennifer is lighter than Sally and Peter means "Jennifer's weight is less than the sum of the weights of Sally and Peter", then the list "Sally and Peter" is undistributive in respect of "Jennifer is lighter than".

The introduction of the technical terms "undistributive" and "undistributive sense" is not intended to imply that there are no important dissimilarities within the sets of sentences containing undistributive lists or lists having undistributive sense. The point of drawing attention to the fact that there are contexts in which "and" lists are undistributive is to show that the presence in the language of certain contexts for which "and" lists are undistributive, or have an undistributive sense introduces the need for a conjunctive connective which, in these contexts, is conjunctively distributive. There are, however, certain contexts for which "and" lists appear to be undistributive or to have undistributive sense as these terms have been defined, and which cannot be considered to contribute to this syntactical need. These I want to exclude from consideration from the outset.

2. P.F.Strawson has noted that for some inter-

pretations of "*f*". the equivalence between a statement of the form '*x* and *y* are *f*' and a statement of the form '*x* is *f* and *y* is *f*' does not hold.

> ...For example, 'Tom and Mary made friends' is not equivalent to 'Tom made friends and Mary made friends'. They mean,usually, quite different things. Nor does such an equivalence hold if we replace 'made friends' by 'met yesterday', 'were conversing', 'got married' or 'were playing chess'. Even 'Tom and William arrived' does not mean the same as 'Tom arrived and William arrived'; for the first suggests 'together' and the second an order of arrival. (ILT p.80)

Strawson has included two sorts of sentences in which "and" lists are undistributive: those which carry a suggestion of togetherness, and those which imply mutuality. The sentence "Tom and Mary met" is not equivalent to "Tom met and Mary met" because the former sentence carries a suggestion of mutuality that the latter sentence does not. We might as well say that they are not equivalent because the former sentence makes sense and the latter sentence does not. But the second sentence fails to make sense because the verb "met" as a transitive verb, requires a direct object. The reason why the former sentence makes sense is that a direct object is understood, namely, "one another". It is unnecessary, in practice, to include the words "one another", because the sentence cannot have sense unless these words are understood. With other sentences such as "Tom and Mary got married" which carry a suggestion of mutuality, some modifying phrase containing "one another" is also understood, but neither the suggestion of mutuality nor the understanding of the "one another" phrase is necessary in order for the sentence to make sense. The inclusion of the "one another" phrase does not affect the distributive properties of "Tom and Mary". The sentence "Tom and Mary met one another" is not equivalent to "Tom met one another and Mary met one another". "one another"requires a compound subject.

If when we say that a sentence such as "Tom and Mary met" carries a suggestion of mutuality, we mean only that either the words "one another" or some phrase containing these words is understood, then in sentences like "Tom and Mary met" and "Tom and Mary got married" where these carry a suggestion of mutuality, the expression "Tom and Mary" is not really a list which is undistributive or which has an undistributive sense. What gives the list an appearance of being undistributive in "Tom and Mary met" and having an undistributive sense in "Tom and Mary got married" is the fact that "Tom and Mary met" does not imply "Tom met and Mary met" and "Tom and Mary got married" is not equivalent to "Tom got married and Mary got married" and the implication and equivalence do not hold between the corresponding pairs of sentences where "one another" and "to one another" have been inserted. But it is only because the words "one another" and "to one another" are understood that the expression "Tom and Mary" seems any more to be undistributive or to have an undistributive sense in these sentences than it does in the sentence "Tom and Mary forgot their coats". For this sentence does not necessarily imply the conjunction of "Mary forgot their coats" and "Tom forgot their coats". It may imply "Tom forgot his coats and Mary forgot her coats". What we must say about this sentence is, not that the expression "Tom and Mary" is undistributive, but that we do not know what if any pronominal adjustments must be made in the course of distribution in order to retain the sense of the original sentence. We cannot tell from the sentence, without specifying a context, whether the coats forgotten belong to Tom and Mary severally or jointly or to some other people, and if the coats do belong to Tom and Mary, how many coats it was that each of them forgot. But the answer to this question is the answer to the question concerning what adjustments must be made <u>in distribution</u>, and the answer to this question should be clear from the context. The point is, that in order to have sense, the sentence must be equivalent to some sentence to the effect that Tom forgot some coat or coats and Mary forgot some coat or coats. The sort of pronominal adjustment that must be made in distribution varies with the sort of relative pronoun that occurs in the original sentence, and may depend upon what sense the original sentence was supposed to have. The "one another" in the sentence "Tom and Mary married one another" requires that we substitute for it in each of the conjuncts of the resulting sentence, the name from the original sentence that is not already in the subject place. By distribution, the sentence becomes "Tom married Mary and Mary married Tom". This sentence is equivalent to the original sentence in that it says of Tom and Mary precisely what the original sentence said of Tom and Mary, and, it can be noted, is ambiguous as to what it says about Tom and Mary in precisely the way that the original sentence is ambiguous. That is, it is not clear from either sentence whether Tom and Mary became one anothers spouse or, as members of some non-conformist clergy, they merely performed the ceremony for one another. It is not necessary to regard lists as undistributive or as having an undistributive sense simply because pronominal adjustments must be made in distribution over them.

The presence of possessive pronouns appear to raise difficulties when there is no other single pronoun that can be substituted for it in the components of the sentence resulting from distribution. For example, the sentence "Tom and Mary saw their father" implies the sentence "Tom saw his father and Mary saw her father", but this sentence does not imply the former because it does not imply that Tom's father and Mary's father is one and the same person. This sentence appears to be one containing a list having an undistributive sense according to the definition of "undistributive sense" given above. But the availability of a single pronoun is not essential to distributiveness. It is sufficient for the present purposes, for the list "Tom and Mary" to be classified as distributive, that the sentence "Tom and Mary saw their father" be equivalent to "Tom saw his and Mary's father, and Mary saw her and Tom's father.

The necessity of pronominal adjustment and adjustment of number present certain difficulties for the use of "$\wedge$", particularly if "$\wedge$(   )" is to represent the verbal content of the context of a list. If "$\wedge$ (   )" represents a context for which an "and" list is normally conjunctively distributive, we will want to write this as the implication of "$\wedge(a_1$ and a_2 and a_3 and...)" of "$\wedge(a_1)$

& (a_2) & (a_3) &..." But if "$\wedge$" in the original sentence contains grammatical elements which agree in number or gender with "a_1 and a_2 and a_3 and...", then there is no guarantee that the retention of "$\wedge$" in each of the conjuncts of the sentence resulting from distribution will not result in loss of grammaticality or change of sense. In order for the conjunctive sentence to retain the sense of the original, plural verbs in agreement with "a_1 and a_2 and a_3" may have to become singular to agree with "a_1", "a_2", and "a_3", as in the move from the sentence "Fred and Bill and Jack <u>have</u> become rich dishonestly" to "Fred <u>has</u> become rich dishonestly and..." I have said that plural verbs <u>may</u> have to become singular, because "a_1", "a_2" and "a_3" may be plural. But if "a_1", "a_2" and "a_3" are singular, then verbs which are plural in agreement with the list must become singular to agree with the members of the list. This need not present insuperable difficulties for the "$\wedge$" notation if we remember that verbs which are plural in agreement with an "and" list become singular to agree with members of the list even when no <u>verbal</u> adjustment must be made. There is as much a change of number of the verb between "Fred and Bill became rich" and "Fred became rich and Bill became rich" as there is between "Fred and Bill are rich" and "Fred is rich and

Bill is rich". We can regard the number of the verb as being independent of the verbal form of the verb and as being wholly determined by the number of the subject. Substituting a singular form of the verb for a plural form could be regarded, not as changing the number of the verb, but as indicating that the number has changed. For purposes of retaining sense, the verbal adjustment can be regarded as redundant, and the change of number of verbs can be regarded as automatic. Possessive and other pronouns, however, present slightly different problems.

The difficulty with pronouns is that they may, but need not agree in number and gender with the list expression, and therefore adjustment of number and gender is not necessary for the preservation of grammaticality. If grammaticality would be lost without adjustment, then we could regard "$\wedge$" as self-adjusting inrespect of pronouns as well as verbs. But since grammaticality would not be lost through failure to adjust the number and gender of pronouns, retention of the original pronominal forms in the sentence resulting from distribution could result in a change of sense. There are two alternatives: either (a) we must be prepared to make the necessary pronominal adjustments in which case either we must not use "$\wedge$" in both the original sentence and the sentence resulting from distribution or we must put an inconsistent interpretation on it, either of which makes the use of distribution terminology unjustifiable, or (b) we must say that the list is undistributive. Since it is more useful to classify the list as distributive than as undistributive, the use of "Λ" to represent the verbal content of the context of the list seems impossible. We can sidestep this problem by regarding "Λ" as representing, not the verbal content of the context of the list, but the verbal content of a sort of normal form of the context. In this normal form, descriptions containing, for example, possessive pronominal adjectives would be replaced by descriptions containing genitives of nouns, and these descriptions would remain unchanged in the sentence resulting from distribution. In practice, it will be unnecessary actually to translate contexts into these forms; it is sufficient to justify the use of a single character to represent both the context of the list and the context of the members of the list after distribution that such a translation is possible. It will be assumed hereafter that if it is claimed that for certain contexts "$\Lambda(a_1$ and a_2 and a_3 and...)" does not entail "$\Lambda(a_1)$ & $\Lambda(a_2)$ & $\Lambda(a_3)$ &...", this is being claimed for reasons other than that the retention of "Λ" throughout distribution would result in loss of grammaticality or change of sense for want of pronominal adjustment.

3. The expressions "$\Lambda(a_1$ and a_2 and a_3 and...)" and "$\Lambda(a_1$ or a_2 or a_3 or...)" have the appearance of expressions representing predications. However, I shall use these expressions without making the claim that the sentences represented are capable of being represented as a predication of what is represented by "Λ" of what is represented by the expression occurring inside the brackets. Likewise "$\Lambda(a_1)$" represents a sentence containing a proper name or description. The use of expressions of this form is neutral in respect of the question whether the sentence which it represents can be represented as a predication of some predicable constituting the content of "Λ" of whatever is represented by "a_1".

The main difficulty that would be introduced along with the introduction of a predication reading of "$\Lambda(a_1$ and a_2 and a_3 and...)" and "$\Lambda(a_1$ or a_2 or a_3 or...)" is the following. "$\Lambda(\ \ )$" represents a natural context in which a list might occur in ordinary speech. It will be part of my purpose to show that the distributive properties of a list occurring in the context "$\wedge$(   )" depend in part upon the content of "$\wedge$". If we are allowed to describe any sentence in which a list occurs as 'the predication of...(the content of "$\wedge$") of a_1 and a_2 and a_3 and...' or 'of a_1 or a_2 or a_3 or...', then we are licensed to regard the distributive properties of a list in any context as being the same as the distributive properties of the same list in the context "the predication of... of (   )", and there is no reason to suppose that the distributive properties of lists occurring in this context are anything but constant. There is no normal use to which we can refer to show that the expression "the predication of 'f' of a_1 or a_2 or a_3" should be interpreted other than as equivalent to "the predication of 'f' of a_3" independently of the interpretation of 'f'. The interpretation of "$\wedge$(a_1 or a_2 or a_3)", where 'f' constitutes the content of "$\wedge$", is not independent of the interpretation of 'f'. It is true, of course, that reading "$\wedge$(a_1 and a_2 and a_3 and...)" as the predication of the content of "$\wedge$" of a_1 and a_2 and a_3 and... need not involve using the words "the predication of the content of '$\wedge$' of a_1 and a_2 and a_3 and...", and so need not involve introducing this new context. But the use of any such device as "It is true as regards... that..." or "...is such that..." likewise introduces a constancy of context which is not present for normal occurrences of the list. There is no reason to suppose that the distributive properties of the list would remain unchanged where such a translation had been made.

In view of the fact that the expressions "the predication of...of...", "it is true of...that...", "...is such that..." are technical devices without an established normal use in ordinary speech, one might feel inclined to suppose that we could stipulate that the distributive properties of lists occurring in contexts in which these devices occur would be the same as their distributive properties in the context in which they occur naturally. But although this procedure would preclude changes in the distributive properties of the lists under examination, it would tend to prejudice at least one other issue. With each of the above predicative devices, one of the spaces is filled with a proper name or description or, in this case, with a list of proper names or descriptions. When a distributive list is inserted in the appropriate space and a predicable in the other space, the resulting sentence is elliptical for a combination of sentences each of which contains a proper name or description in the name-place. Thus the central use of these devices is that in which a name or description is supplied. This fact produces the result that when an undistributive list is inserted in the name-place, the question seems already answered whether the list is standing in the place of a proper name. Since this is a question which I want to raise, it will be advisable not to suggest, by the use of a misleading terminology, that the answer is an obvious one.

4. There is one other point which I wish to make before embarking upon an examination of particular sorts of context. It is that the question as to what distributive properties a list has in a certain context is the question 'What combination of "$\wedge(a_1)$", "$\wedge(a_2)$", "$\wedge(a_3)$" etc., if any, would the sentence "$\wedge$(a_1 and (or) a_2 and (or) a_3 and (or)...)" be taken to imply if it occurred in normal conversation?' One important fact emerges. The distributive properties that a list has in a particular sort of context are not fixed by laws of logic. Within certain limits, we can influence the interpretation that list-containing sentences are likely to receive. First,

we can so construct the contextual matter that the distributive properties of the list are what they are because the contextual matter precludes any other interpretation. To give an obvious example, we preclude an undistributive interpretation being put on the list "a_1 and a_2" in "$\wedge$(a_1 and a_2)", when we say "$\wedge$(a_1 and a_2); so (a_1)". This sort of influence will be dealt with more fully later. In addition, we can limit the range of possible interpretations of a list-containing sentence by providing relevant information about the members of the list. We can do this either by building this into the terms of the list, or by offering it separately in the context of the list. The sentence "Tom and Mary got married" often, perhaps normally, carries an implication of mutuality, but we can suggest lists that would resist such an interpretation, for example "Jim and Fred", "Susan and Alice", or any list having more than two members, or a list of two pairs of people who in fact did marry one another. Likewise, we can construct lists such that sentences containing them resist interpretation as suggesting togetherness, simply by choosing x and y in such a way that "x and y are f" must simply mean "x is f and y is f". "Billy Graham and William Shakespeare arrived in London" is unlikely to be interpreted as implying that these men arrived in London together. Finally, we can preclude an undistributive interpretation being put on a list by working sufficient information into the terms of the list, or by giving the same information outside the sentence in which the list occurs. The sentence "a_1 is heavier than a_2 and a_3" might be interpreted as implying the claim that a_1 is heavier than a combination of a_2 and a_3, but the sentence "a_1 who weighs 10 stone, is heavier than a_2 who weighs 9 stone and a_3 who weighs 8 stone" is unlikely to be interpreted in this way. And the sentence "a_1 is heavier than a_2 and a_3" is unlikely to be interpreted as implying this claim if it is preceded by the words "a_1 weighs 10 stone; a_2 weighs 9 stone and a_3 weighs 8 stone; so..."

The relevance of these facts is that in the following, many of the statements to the effect that certain sentences are normally interpreted in certain ways require qualification by dark <u>ceteris paribus</u> clauses. The conclusions that are based on these observations must necessarily be conclusions which it is reasonable to draw from premisses qualified in this way. But this is a difficulty that is inherent in the subject-matter.

CHAPTER TWO

5. The main ambition of this chapter will be to offer a description and the beginnings of an account of some of the non-propositional uses of "or". This will partly involve giving some account of the distinction between the logical roles of "or" and "and". In addition, I shall try to show that the account of the distinction between "or" and "and" provides a basis for an account of the distinction between "either" and "both" and the distinction between "any" and "every". The account that I shall propose of the distinctions between "or" and "and", "either" and "both", and "any" and "every" is not a particularly neat account, especially by comparison with the account that Professor Peter Geach has given of the distinction between "any" and "every". But the neatness of philosophical accounts is generally in inverse proportion to the number of relevant facts that they take into account. The facts of the case are, I shall claim, superficially at least, rather messy. Geach's view is that every sentence of the logical form "f(any A)" is equivalent to a propositional conjunction of the form "$f(a_1)$ & $f(a_2)$ & $f(a_3)$ &..." I shall claim that the logic

of a rather special conjunctively distributive list whenever a sentence of the form "f(any A)" is equivalent to the conjunction of the results of predicating "f" of the A's severally. But I shall also claim that sometimes the logic of expressions of the form "any A" is precisely the logic of a disjunctively distributive list. The view that I shall advocate is superficially similar to but not identical with a view which Geach says we ought to avoid. His assumption seems to be that we cannot come to hold this view without first committing what he calls the cancelling-out fallacy. As Geach explains:

> We just cannot infer that if two propositions verbally differ precisely in that one contains the expression E_1 and the other the expression E_2, then, if the total force of the two propositions is the same, we may cancel out the identical parts and say that E_1 here means the same as E_2. I shall call this sort of inference <u>the cancelling-out fallacy</u>. (Reference and Generality. p.61)

Part of the purpose of the present discussion is to shed some light on the question "What are the permissable ways of getting at the meaning of what Ryle has called "topic-neutral" words?" and on the prior question "To what extent can we even talk about the 'meaning' of topic-neutral words?" Implicit in the discussion is an attempt to resist the attitude to which the belief that what Geach calls cancelling-out is a fallacy, might unnecessarily predispose us: namely, that it is never correct to say that the expression E_1 here means the same as E_2 although in other contexts it does not. The most that Geach can have established is that we cannot infer this from the fact that the propositions, the verbal differences of which are precisely accounted for by E_1 and E_2 have the same total force. He has not established that there are no ways of establishing a change in the meaning of E_1 between two contexts. Some of the examples of sentences which I shall examine seem incapable of explanation in terms of Geach's account of "any" and seem to indicate something like a change of meaning, or at least a change of logical role. The discussion falls roughly into three parts. In the first I discuss the role of "or" as a non-propositional connective and the relation between this use of "or" and the corresponding use of "and". The second part contains a discussion of the relation between the "or/and" distinction and the "either/both" distinction and the relation of both these distinctions to the "any/every" distinction. The third section is a rather extended discussion of the relation between the logical role of expressions of the form "any A" and the logical behaviour of lists formed with "or".

I want to draw attention to the complexity of the logic of "or" as a non-propositional connective, by showing how it has become a source of confusion. The dispelling of this confusion must expose as hopelessly simple-minded, the grammarians view that sentences in which "or" connects nouns or adjectives are elliptical for sentences in which "or" connects component sentences. The examination of the non-propositional logical role of "or" will, I think, provide information relevant to the question of the difference between "any" and "every", and to the question of the alleged correlation between sentences of the logical form "f(any A)" and propositional conjunction. In addition, the outcome of the discussion of the relation between the non-propositional and propositional uses of "or" must affect the ways in which it is possible to formulate postulate sets for calculi which are not exclusively propositional.

6. In <u>The Logic of Preference</u> (Edinburgh, 1963), G.H. Von Wright claims that 'disjunctive preferences are conjunctively distributive' (p.26). He bases this basic postulate of his calculus on facts of the following sort. If someone claims that he prefers either icecream or pudding to cake, then we can infer from

this that he prefers icecream to cake and pudding to cake. Symbolizing the state characterized by the presence of icecream by "p", the state characterized by the presence of pudding by "q", the state characterized by the presence of cake by "r", and the relational expression "is preferred to" by "P", we can, Von Wright would claim, express the above-mentioned fact by the formula:

$$(p \vee q)\ P\ (r) \rightarrow (p\ P\ r)\ \&\ (q\ P\ r)$$

I want to claim that the preference expressed by the sentence "I prefer either icecream or pudding to cake" is not a disjunctive preference and that the fact that if a person has this preference then he prefers icecream to cake and pudding to cake is not representable by the above formula or any formula derivable from it.[1]

1. The formula which I have given (p.39) is not the formula which is found in the postulate set of Von Wright's Prohairetic Calculus. The formula which Von Wright uses to reflect his distribution principle is the following:

$$(p \vee q)\ P\ (r \vee s) \equiv \{(p\ \&\sim r\ \&\sim s)\ P\ (\sim p\ \&\sim q\ \&\ r)\ \&\ (p\ \&\sim r\ \&\sim s)\ P\ (\sim p\ \&\sim q\ \&\ s)\ \&\ (q\ \&\sim r\ \&\sim s)\ P\ (\sim p\ \&\sim q\ \&\ r)\ \&\ (q\ \&\sim r\ \&\sim s)\ P\ (\sim p\ \&\sim q\ \&\ s)\}.$$

However, this formula differs from the formula which is given above only in that it is a biconditional and in that it assumes the principle of conjunctive expansion (i.e., "$(p\ P\ q) \equiv (p\ \&\sim q)\ P\ (\sim p\ \&\ q)$") This principle is defective for other reasons. For a discussion of this see my "Preference and Choice as Logical Correlates" forthcoming in Mind.

The representation of the fact that the sentence "Jones prefers a_1 or a_2 to a_3" implies "Jones prefers a_1 to a_3 and Jones prefers a_2 to a_3" by use of the formula given above, assumes that the relational expression "is preferred to..." would be distributive over a propositional expression "p v q" in precisely the same way in which it is distributive over the list "a_1 or a_2". The same assumption is made whether "a_1 or a_2" is a list of objects or a list of states of affairs. It makes no difference that we use propositional expressions in the course of identifying states of affairs, i.e., that we can say "the state of affairs in which it is the case that p". This fact does not license us to replace what is essentially a list expression, namely, "the state of affairs in which p or the state of affairs in which q" with the propositional expression " p v q" or even the nominal expression "the state of affairs in which it is the case that p v q". The various problems associated with such a translation will be discussed in some detail later. For the present, I assume that the presence of propositional expressions in the terms of "a_1 or a_2" does not make this expression any the less a list. How does it come that a list formed with "or" permits conjunctive distribution of its context over it?

Consider the following two sentences which are of apparently identical grammatical structure:

(1) Mary is heavier than either Jack or Bob

(2) Mary is related to either Jack or Bob

Whereas the former sentence would normally be taken to be equivalent to "Mary is heavier than Jack and Mary is heavier than Bob", the second would normally be taken to be equivalent only to "Mary is related to Jack or Mary is related to Bob". Why is there this difference of logical sense between these two sentences? One might want to explain this distributional discrepancy by saying that the distribution rules for the relational expression "is heavier than" are different from the distributional rules for the relational expression "is related to", that is, that whereas some relational expressions are conjunctively distributive over adjacent disjunctive list expressions, other relational expressions would only be disjunctively distributive over the same list expressions. Some relational expressions have this property and others do not, and the relational expression "is preferred to" happens to have it.

The difficulty with this sort of explanation is that having said that certain relational expressions are conjunctively distributive over adjacent disjunctive list expressions, we are bound to explain why some relational expressions have this property and others do not. In addition we should have to justify the assumption that every list formed with "or" is a disjunctive list. The classification of all "or" lists as disjunctive lists could be done only on the basis of the use of "or" in the construction of the lists. There could be no independent feature apart from this by virtue of which the classification could be made. There is some independent feature of propositional disjunction in virtue of which we say that it is disjunctive, namely its truth-conditions. The only ways in which lists can be distinguished are by the connective and by the distributive properties. Unlike propositional expressions, whose truth-conditions remain constant regardless of distributive properties, list expressions have only a constant appearance.

A second difficulty with this sort of explanation is that if conjunctive distribution over adjacent "or" lists is a property of certain relational expressions, then it is a property that they can lose momentarily. We can invent contexts in which these relational expressions would normally be interpreted as being disjunctively distributive over the adjacent "or" list and other contexts in which relational expressions which would otherwise be interpreted as being disjunctively distributive over the adjacent "or" list, would be naturally interpreted as being conjunctively distributive over the list. We can say, for example, "Mary is heavier than either Jack or Bob, but I can't remember which" or "Mary is related to either Jack or Bob; so it doesn't matter which of them you choose". The fact that these sentences are acceptable, though perhaps not literary, English shows that conjunctive distribution over adjacent "or" lists is neither an inalienable property of the relational expression "is heavier than" nor an unattainable property for the expression "is related to".

One consideration seems to indicate that at least as satisfactory an explanation could be achieved by regarding the distributive peculiarity of the sentence "Mary is heavier than Jack or Bob" as a result of a special, idiomatic, conjunctive use of "or". This consideration is as follows. In contexts where it is clear that the two men being referred to are Jack and Bob, we can say, instead of "Mary is heavier than Jack or Bob", "Mary is heavier than either man". We could not, without a change of sense, say "Mary is related to either man" rather than "Mary is related to Jack or Bob". The fact that the sentence "Mary is heavier than either man" means the same as "Mary is heavier than Jack and Mary is heavier than Bob", seems more a consequence of the presence of "either man" than a consequence of the expression "is heavier than". The presence of "either man" in "Mary is related to either man" makes this sentence equivalent to a propositional conjunction, even though "Mary is related to Jack or Bob" would not normally be interpreted in this way. This would seem to suggest that in some contexts, an "or" list has a logic rather like that of the expression "either A" while in other contexts, it does not. It is misleading, therefore, to describe the discrepancy as a difference in rules for distribution over adjacent disjunctive expressions. An explanation will be made easier if the facts of the case are stated in more neutral terms. Accordingly, I shall restate the discrepancy in this way: whereas for some relational expressions, adjacent "or" lists are usually disjunctively distributive, for other relational expressions, adjacent "or" lists are conjunctively distributive. Remembering that not only the relational expressions "is heavier than" and "is related to" are distributive over the list expressions in these sentences, but the whole of the remainder of each sentence, we can state the facts of the case using the "Λ" terminology that was introduced in the preceding chapter: some sentences of the form "$\Lambda(a_1$ or $a_2)$" are equivalent to sentences of the form "$\Lambda(a_1)$ & $\Lambda(a_2)$" and some sentences of the form "$\Lambda(a_1$ or $a_2)$ are equivalent to sentences of the form "$\Lambda(a_1) \vee \Lambda(a_2)$".

In its original statement as a difference in the distributive properties of different relational expressions, it is difficult to see what sort of explanation can be given of this distributional discrepancy. Restated as a difference in the distributive properties of the "or" lists, we can ask, why should it be necessary that in some contexts, an "or" list should be conjunctively distributive? Why is there a need for a conjunctively distributive "or" list in the context "Mary is heavier than( )"? Is there a need?

The context "Mary is heavier than( )" and the context "Mary is related to( )" differ in the following respect. When a list of the form "a_1 and a_2" occurs in the context "Mary is related to ( )", it is not possible to construe the resulting sentence other than as being equivalent to the conjunction of "Mary is related to a_1" and "Mary is related to a_2". However, when an "and" list occurs in the context "Mary is heavier than( )", this could be construed as meaning something like "Mary's weight exceeds the combined weights of a_1 and a_2". Although this sentence implies the sentence "Mary is heavier than a_1 and Mary is heavier than a_2", these sentences are not equivalent. Mary can be heavier than a_1 and heavier than a_2 without being heavier than the combination of a_1 and a_2, although she cannot be heavier than the combination of a_1 and a_2 without being heavier than a_1 and heavier than a_2. Using the terminology introduced in the previous chapter, in the context "Mary is heavier than ( )", an "and" list could be interpreted as having an undistributive sense, although the logic of "is heavier than" precludes an interpretation of the "and" list as being undistributive. It is a further feature of the relational expression "is (are) heavier than" that an "and" list occurring in the context "( ) are heavier than a_3" could be interpreted as being undistributive, although here, the number of the verb makes this less likely. If the combined weight of a_1 and a_2 is greater than the weight of a_3, this does not imply that a_1 is heavier than a_3 or a_2 is heavier than a_3. But the plural verb in "a_1 and a_2 are heavier than a_3" makes it less likely that this sentence would be interpreted as meaning that the sum of the weights of a_1 and a_2 exceeds the weight of a_3, without other contextual clues to reinforce this interpretation. In some tenses, however, the form of the verb provides no indication of distributiveness. I want to suggest that there is a connexion between the possibility of interpretation of "and" lists as being undistributive or as having an undistributive sense and the conjunctive distributivity of a substituted "or" list in that context. My suggestion is not that the conjunctive distributivity of "or" lists in certain sorts of contexts has evolved as a means of precluding misinterpretations, although the possibility of error in some cases makes it highly desirable that there should be some essentially distributive construction for these contexts. But if in some contexts, the "and" list normally is undistributive or has an undistributive sense, and in these contexts, an "or" list is as a matter of idiom, normally interpreted as being conjunctively distributive, then it is a reasonable conclusion that the reason for the existence of a conjunctively distributive "or" list is that it provides a conjunctively distributive list which is not capable of interpretation as being undistributive or as having an undistributive sense. The context "Mary is related to(   )" is not a context in which an "and" list could be interpreted as being undistributive or as having undistributive sense, so this is a context in which a special distributive conjunctive construction is not required. Hence, in this context, an "or" list is normally interpreted as being just disjunctively distributive.

The relational expression "is preferred to" is such that in the context "( ) is preferred to a_3" and in the context "a_3 is preferred to( )", an "and" list would normally be interpreted as being undistributive. A person can prefer bread and butter to dry rolls without preferring butter to dry rolls. Likewise, he can prefer dry rolls to bread and butter without preferring dry rolls to bread. Therefore, these contexts are contexts in which a list is required which is both conjunctive and conjunctively distributive. Hence, "a_1 or a_2 is preferred to a_3" means "a_1 is preferred to a_3 and a_2 is preferred to a_3".

7. A **causal** relation between the presence in the language of contexts in which "and" lists are undistributive and the presence of conjunctively distributive "or" lists would be difficult to establish. The correlation which I have suggested exists between a context's being such that in it an "and" list would be undistributive and the same context's being one in

which an "or" list would be conjunctively distributive is general, but not universal. That is, there are contexts for which an "and" list would be undistributive and for which, nevertheless, an "or" list would not be conjunctively distributive, and there are contexts for which an "or" list would be conjunctively distributive and for which nevertheless an "and" list could not be undistributive. The examples of contexts of the first sort which one most readily thinks of are contexts in which an "and" list would be undistributive and in which an "or" list would not be possible English, such as the context "a_1 is between( )". Other contexts where the correlation seems not to hold are those in which what is predicated of "a_1 and a_2" can be predicated only of one object or collection of objects, such as "a_1 is owned by( )". It is obvious that in this context, an "or" list must be disjunctively distributive, since because the predicable "a_1 is owned by..." must apply uniquely, the conjunctive distribution of the context "a_1 is owned by( )" over a list must result in an incomprehensible conjunction. On the other hand, "or" lists occurring adjacent to comparative adjectival or adverbial expressions are normally conjunctively distributive in spite of the fact that an "and" list in such a context could not possibly be construed as being undistributive or as having an undistributive sense. The sentence "Claudia is more beautiful than Monica or Sophia" is equivalent to the sentence "Claudia is more beautiful than Monica and Claudia is more beautiful than Sophia", but the sentence "Claudia is more beautiful than Monica and Sophia", if it means anything at all must mean the same thing. An ardent admirer might claim that Claudia is more beautiful than Monica and Sophia put together, but the force of this is normally no more than that Claudia is much more beautiful than Monica and much more beautiful than Sophia, not that Claudia is more beautiful than would be the assemblage of the most comely parts of the other two. But even if it were, that this sentence had this force would be due to the words "put together", not to "and", and in this context, an "or" list would not have any relevant sense at all. Normally, in sentences containing comparative adjectival or adverbial expressions, "or" lists are more idiomatic than "and" lists. If the correlation were universal, one would expect "and" lists to be idiomatic and distributive, and "or" lists to be disjunctive.

The examples of contexts which are exceptions to the correlation between undistributiveness of "and" lists and conjunctive distributiveness of "or" lists do not establish that there is no causal connexion between the presence of contexts for which "and" lists are undistributive and the presence of conjunctively distributive "or" lists. Neither the context of the "and" list in the first sentence nor the context of the "and" list in the second sentence is a context for which a conjunctively distributive list is possible, and therefore, neither context is one for which a conjunctively distributive list is required. If there is a causal connexion between the presence in the language of contexts for which "and" lists are undistributive and the presence in the language of conjunctively distributive "or" lists, the contexts will be those in which "and" lists are undistributive and which require in addition, conjunctively distributive lists. The fact that "or" lists are conjunctively distributive for contexts containing comparative adjectival or adverbial expressions where "and" lists would not be construed as being undistributive or as having an undistributive sense does not disprove the suggestion that conjunctively distributive "or" lists are present in the language because there are contexts for which "and" lists are undistributive or have undistributive sense. This fact could merely indicate that the use of "or" lists as distributive conjunctive constructions has become generalized beyond need.

8. The conjunctively distributive "or" list has, for the most part gone unnoticed or its syntactical significance has been minimized. For example, the following sentences occur in Reference and Generality

> It is equally congruous to say "Only Bill can have opened the safe" and "Only Bill, Tom, John can have opened the safe". (The "or" that would be inserted between the items of the list in spoken English has no logical significance) R&G. p.169.

In other discussions, the distinction between disjunctively distributive "or" lists and conjunctively distributive "or" lists is treated as though it were identical with the distinction between non-exclusive and exclusive disjunction. In a footnote to a discussion of disjunctive permission in his essay "Deontic Logic" (in Logical Studies. New York, 1957. p.64), Von Wright says:

> When we say that we are permitted to do A or B, we sometimes mean, by implication, that we are permitted to do both. Sometimes however, we mean that we are allowed to do only one or the other of the two acts. Which meaning the "or" conveys by implication depends upon the material nature of the individual case, in which it is used. It ought to be stressed that our use of 'or'

> in this paper is neutral with regard to such material differences in the individual situations. That we are permitted to do _A or B_ here means that we are permitted to do at least one of the two acts, and neither excludes nor includes, by implication, the permission to do both.

The first point here is that there is _no_ meaning of "or" such that "You may do A or B" includes by implication, permission to do both A and B, except insofar as to give a person permission to do A and also give him permission to do B is, by implication to give him permission to do both A and B. Normally, "A or B" in this context is a conjunctively distributive list. "You may do A or B" normally means "You may do A and you may do B". This is in contrast to the sense that the sentence would have if "A or B" were a disjunctively distributive list in this context. If this were the case, the sentence "You may do A or B" would mean"Either you may do A or you may do B", and could not be used to give permission at all. The sentence would be true independently of whether or not the person has permission to do A and has permission to do B, depending upon whether the "or" is non-exclusive or exclusive. That is, the difference between "You may do A or B" where "or" is exclusive and where it is non-exclusive is not that in the former case, "You may do A or B" implies

"You may not do both A and B" while in the latter case, "You may do A or B" includes by implication permission to do both A and B. The difference is that in the former case, "You may do A or B" is incompatible with "You may do A and you may do B" while in the latter case, "You may do A or B" is compatible with "You may do A and you may do B". Even in this latter case, permission is not being given, by implication or otherwise, to do A <u>or</u> to do B. No permission is being given at all.

The expression "You may do A or B as it occurs normally in English implies permission to do A and permission to do B. It neither includes nor excludes, by implication, permission to do both A and B. Von Wright has recognized that permission to do A and permission to do B does not imply permission to do A & B.

> ...from the fact that A and B are both permitted, it does not follow that <u>A & B</u> is permitted. Sometimes <u>A & B</u> is permitted, sometimes not. For A and B may both be permitted, but doing either of them may commit us not to do the other. I may be free to promise and also free not to promise to give a certain thing to a person, and free to give and also free not to give this thing to him, but forbidden to promise to give and yet not give it. (<u>LS</u>. p. 64)

The expression "You may do A or B, but not both", excludes permission to do both A and B, but as we have seen, this is not a disjunction made explicitly exclusive, but a conjunctive list made exclusively distributive.

It may be objected to this criticism of Von Wright's footnote (which is, after all, only a footnote), that when he says "When we say that we are permitted to do A or B, we sometimes mean, by implication, that we are permitted to do both" he means by the phrase "permitted to do both", simply "permitted to do either". If this is so, then this says only that sometimes, "You may do A or B" gives, by implication, permission to do A and permission to do B. At worst, this would be an understatement. When the sentence "You may do A or B" gives permission at all, it gives permission to do A and permission to do B. And when it does so, it does so directly, not by implication. But even if this is so, there remains a confusion about the difference between "You may do A or B" where the list "A or B" is disjunctively distributive and "You may do A or B" where the list is conjunctively distributive. The difference is not the difference between exclusive and non-exclusive disjunction. Even if the sentence "You may do A or B" were equivalent to the non-exclusive disjunction of "You may do A" and "You may do B", this would not, even by implication, give permission to do A and permission to do B. The difference between a non-exclusive and an exclusive disjunctive list in this context would be the difference between a sentence which is compatible with a sentence giving permission to do A and permission to do B, and a sentence which is incompatible with such a sentence. The difference between a sentence implying a sentence which gives permission to do A and permission to do B, and a sentence implying the contradictory of this sentence is the difference between an "or" list which is conjunctively distributive and an "or" list which is exclusively disjunctive. Von Wright claims that his use of "or" is neutral as between these two latter meanings. By this, he means that in his deontic logic, "v" will have neither of these meanings, that is, that it will be used as a non-exclusive disjunctive connective. There remains the question whether a system in which "v" can stand between names of actions and between propositional expressions involves an equivocation, that is, whether, for example, the interpretation that we must put on "v" in Von Wright's Principle of Deontic Distribution, "P(A v B) ≡ P(A) v P(B)" is an inconsistent interpretation. But this must form a separate discussion.

9. For the present discussion there remains only to mention certain points of contact between the logic of list expressions and that of propositional expressions, and certain important dissimilarities. It might be supposed that from the thesis that because in certain contexts an "or" list is conjunctively distributive, therefore in these contexts an "or" list is a conjunctive rather than a disjunctive construction, we ought to be able to generalize to the thesis that any "or" expression is a conjunctive construction in contexts for which it is conjunctively distributive. If distributivity were the sole determinant of disjunctive construction, then some rather alarming consequences would follow. For example, we should have to put an inconsistent interpretation on "v" in the formula "$(p \vee q) \rightarrow (r \vee s)$", since from this formula we can derive the formula "$\{p \rightarrow (r \vee s)\}$ $\& \{q \rightarrow (r \vee s)\}$", but we can derive only "$\{(p \vee q) \rightarrow r\} \vee \{(p \vee q) \rightarrow s\}$", i.e., not the formula "$\{(p \vee q) \rightarrow r$ $\& \{(p \vee q) \rightarrow s\}$". In view of the difference in distributional possibilities, we should have to say, although "r v s" is a disjunctive expression, "p v q" must be a disguised conjunctive expression. Finally, consistency will demand that we introduce a new symbol to replace "v" here and

wherever anything is conjunctively distributive over it.

The reason why we could not produce this thesis by generalization from the thesis that I have presented is important, and goes as follows: the "v" of the propositional calculus is a propositional connective and the result of flanking it with propositional expressions is to produce a third propositional expression. The connective word "or" is not always a propositional connective, and it is not always the case that by flanking it with two expressions of the same logical status we produce a third expression of the same logical status. "Icecream" is the name of a dessert and "pudding" is the name of a dessert, but "icecream or pudding" is not the name of a disjunctive dessert, nor is "Jack or Bob" the name of a disjunctive man. Whereas it makes sense to say of the disjunction of propositions "p" and "q" that it implies the disjunction of the propositions "r" and "s", it does not make sense to say of Mary that she is related to the disjunction of Jack and Bob. Therefore, although it makes sense to ask what are the conditions under which "p or q" implies "r or s", it does not make sense to ask under what conditions Mary is related to the disjunction of Jack and Bob. The conditions under which "p or q" implies "r or s" are determined by the truth- and falsity-conditions of "p or q" and"r or s". Since the truth of "p" guarantees the truth of "p or q", if "p or q" implies "r or s", then "p" implies "r or s". Similarly, since the falsity of "r" does not guarantee the falsity of "r or s", that "p or q" implies "r or s" does not itself imply that "p or q" implies "r". The point here is that in propositional logic, distribution over the expressions constructed with "v" is determined by the truth- and falsity-conditions of disjunction. Disjunction is defined in terms of truth-conditions, and it is because an expression is disjunctive that it is distributive in the ways that it is. It is not because of its distributive properties that the expression is called 'disjunctive'. On the other hand, for expressions consisting of non-propositional expressions flanking "or", there is no basis on which to say that it is a disjunctive construction, apart from its behaviour as an element of a sentence. It is the truth-conditions of the sentence that provide a basis for classifying the constituent "a_1 or a_2" expression as disjunctive or conjunctive.

The supposition that in the formula

"(p v q) $\rightarrow$(r v s)", the first "v" must be different in meaning from the second "v" could result from the failure to distinguish between the role of "or" in "Either p or q" and the role of "or" in 'Either "p" or "q"'. The sentence which when spoken sounds

Either p or q implies r or s

can be interpreted in either of two ways: as

"Either p or q" implies "either r or s"

or as

Either "p" or "q" implies either "r" or "s"

or as a combination of these.

In the former interpretation, "or" is a propositional connective, and "Either p or q" is a propositional expression; in the latter interpretation, "or" is a non-propositional expression and 'Either "p" or "q"' is a list whose status as being conjunctive or disjunctive is unclear. Using the subordinate conjunction "that", the former interpretation becomes

That p or q implies that r or s;

the second becomes

That p or that q implies that r or that s.

The second of these could be understood as being equivalent to the conjunction of "That p implies that r or that s". That is, the expression "that p or that q" could be understood as a conjunctive construction. But in view of the fact that the sentence 'Both "p" and "q" imply "t"' would certainly be interpreted as being equivalent to '"p" implies "t" and "q" implies "t"', the sentence "That p or that q implies that r or that s" could reasonably be interpreted as being equivalent to "That p implies that r or that s or that q implies that r or that s." Under this interpretation, "that p or that q" is regarded as a disjunctive construction. It is unnecessary to decide which of these two interpretations would be more naturally given. The point of this example is just that whereas we know that "p or q" is a disjunctive expression independently of how 'implies "r or s"'is distributive over it, we have no means of knowing whether the expression '"p" or "q"' is a disjunctive or a conjunctive construction without knowing how "implies..." is distributive over it.

At least part of the time in language, we operate with conjunctive or disjunctive lists of propositions and not with conjunctive or disjunctive propositions. In writing, we can mark the difference between disjunctive proposition and a disjunctive list of propositions by the use of quotation marks or "that" clauses. In speech, there is often no indication in the words that we use whether we are uttering junctive propositional expressions or lists of propositional expressions. There is, however, a reliable indication of the prevalence of operations with lists of propositional expressions in the equivalences that we tend to accept. Sometimes the equivalences that we naturally accept do not indicate whether our acceptance of them is a result of our having learned the operations appropriate to lists or whether they are accepted as a result of our having come to understand the logic of junctive propositions. Our acceptance of the equivalence between the sentence which, when spoken, sounds

p or q implies r

and the sentence which, when spoken, sounds

p implies r and q implies r

does not indicate whether we are treating the expression

p or q

as a disjunctive propositional expression or as a conjunctively distributive "or" list. The equivalence holds in either case. And in addition, our acceptance of the equivalence between

p or q implies r

and

p implies r or q implies r

would not indicate whether we were making the acceptable move of distributing "implies r" over an "or" list, or making the unacceptable claim that '"p or q" implies "r"' is equivalent to '"p" implies "r" or "q" implies "r"'. Often, however, when we make a move which could be either a move which is unacceptable in the logic of propositions or a move which is acceptable in the logic of lists, there is a *prima facie* case that we are operating with lists of propositions rather than with junctive propositions. The insistence of some teachers of elementary logic that one sort of move is *the* correct one and the other mistaken results from failure to recognize the possibility of a non-propositional transformation of sentences containing propositional expressions. For example, the expression

$$\sim\{(p \vee q) \rightarrow r\}$$

is equivalent to the expression

$$\sim(p \rightarrow r) \vee \sim(q \rightarrow r).$$

But the natural interpretation to put on the sentence which when spoken sounds

r is not implied by either p or q

is

r is not implied by p and r is not implied by q.

This is because the spoken sentence is, in the absence of clues precluding this interpretation, naturally taken as meaning

"r" is not implied by "p" or "q"

not as meaning

"r" is not implied by "p or q".

Under the former interpretation, this sentence has the form

ϕ is not true of a_1 or a_2

which means the same as

ϕ is not true of a_1 and ϕ is not true of a_2.

That is, it is not essentially different from the sentence

What I said is not implied by what you said or what the chairman said.

It might be argued that the logical operations implicit in the transformation of the sentence '"r" is not implied by "p" or "q"' into '"r" is not implied by "p" and "r" is not implied by "q"' are propositional, because there is an intermediate step resulting in the sentence

It is not the case that "r" is implied by "p" or "r" is implied by "q"

and this is equivalent to the final sentence by virtue of the falsity conditions of propositional disjunction. But if there is this intermediate step, and it is doubtful that it would be consciously taken, this would not preclude, but rather would depend upon, our having taken "p or q" as a list rather than as a disjunctive proposition.

Similar considerations apply to the sentence which when spoken sounds

Either p or q is false.

It is at least equally natural to interpret it as being equivalent to

Either "p" is false or "q" is false

as to interpret it as being equivalent to

"p" is false and "q" is false.

These examples show that some of the logical moves that we make in language are governed by the logic of lists, even where the pieces are propositional expressions. Sometimes the interpretation of expressions containing propositional expressions as lists of propositions rather than as junctive propositions produces precisely the same results as would have been produced by interpreting these expressions as junctive propositional expressions. Sometimes it does not. Where the interpretation of expressions as lists of propositions rather than as junctive propositional expressions makes no difference it is more difficult to establish that the expression is ever understood as a list of propositions; but when our interpreting the expression as a list makes a difference to the sorts of transformations possible, then the fact that we naturally tend to claim the equivalences that obtain when the expressions are interpreted as lists tends to confirm the view that some of our logical operations are governed by the logic of lists.

Another indication that we sometimes operate with lists of propositions is the following: The proposition produced by disjoining a sentence with its contradictory is trivially true. But an "or" list of two propositions one of which is the contradictory of the other is neither true nor false. So when an expression consisting of two propositions one of which is the contradictory of the other separated by "or" occurs non-trivially, it is probably a list. An example will serve to illustrate this: A and B are in conversation. C passes by. A says, "Hello, C." C turns toward A, glares, and continues on his way. B comments, "He didn't see you". A replies, "Either he didn't see me or he did". Taken out of the context of this story, A's reply would seem to be a tautology. But it is not. The point of "Either he didn't see me or he did" is not to say what is trivially true; it is to say that from C's behaviour, either proposition could be inferred. The point of A's remark is not that from C's behaviour one could infer that either he didn't see A or he did see A. It is that from C's behaviour, one could infer either that he didn't see A or that he did. The expression "Either he didn't or he did" is elliptical for a sentence containing this as a list. It is not a hypothesis, but a list of possible hypotheses.

II

10. In the previous section, I drew attention to the fact that, in English anyway, we can construct conjunctively distributive lists using "or" as a connective. In addition, I tried to show that the sort of context in which these conjunctively distributive "or" lists occur, is often, perhaps usually, the sort of context in which a list formed with "and" has a separate undistributive use. Thirdly, I gave instances of sentences for which rules governing the use of the tautological transformations of junctive sentences determine the equivalences that we claim. In this section, I want to show the relevance of the

fact that it is only in certain contexts that conjunctively distributive "or" lists occur to the account that we must give of the distinction between "either" and "both", and the distinction between "any" and "every".

I have claimed above that the main sort of context in which conjunctively distributive "or" lists occur naturally are those in which an "and" list has an undistributive use, and in which a distributive conjunctive construction is required. It was noted, however, that "or" lists are usually conjunctively distributive in contexts containing comparative adjectival or adverbial expressions regardless of whether an "and" list could conceivably have an undistributive use in these contexts. Indeed, in this sort of context, conjunctively distributive "or" lists are often more idiomatic than "and" lists. The fact that we can specify the sort of context in which conjunctively distributive "or" lists normally occur provides a means of showing the relation between the logical role of such lists and the logical role of the expression "either A". One feature of the relation can be brought out in the following way. Suppose that "a_1" and "a_2" are proper names, and "A" is a general word such that a_1 is an A and a_2 is an A.

Then, whenever the list "a_1 or a_2" is conjunctively distributive, we can substitute for the list "a_1 or a_2" the expression "either A". Whenever the context "Λ(   )" is such that "Λ(a_1 or a_2)" is true iff "$\Lambda(a_1)$ & $\Lambda(a_2)$" is true, then, in addition,
(a) "Λ(a_1 or a_2)" is true iff "Λ(either A)" is true, and
(b) "Λ(   )" is a context in which "either A" would normally occur. It is important that (b) is the case, just because, for any true sentence consisting of a conjunctively distributive list of A's occurring in the context "Λ(   )", a true sentence would be produced by substituting the expression "either A", but the sentence that would be produced by such a substitution would not necessarily be normal English. In most contexts, "both A's" would be a more natural form of speech than "either A". We would say, for example, "Both children went home", but would not normally say "Either child went home".

In addition to the fact that the expression "either A" is substitutable for any two-termed conjunctively distributive "or" list, it is also the case that for any normal occurrence of "either A", the list "a_1 or a_2" can be substituted, although this should not be taken to imply that for any context, in which "either A" would occur normally, a substituted "or" list would be conjunctively distributive.

A similar correlation holds for the expression "both A's" and two-termed "and" lists, but because "and" lists are always conjunctive, the correlation is more straightforward than the correlation between "either X" two-termed and "or" lists. For any two-termed "and" list, an expression of the form "both A's" can be substituted and for any occurrence of an expression of the form "both A's", a two-termed "and" list of A's can be substituted.

The correlations between two-termed "or" lists and "either" and between two-termed "and" lists and "both" together with the general correlation between "and" lists and conjunctively distributive "or" lists provides a means of understanding the relation between the logical roles of "both" and "either". In any context in which an "or" list would be conjunctively distributive, it will be logically objectionable to intersubstitute between "either A" and "both A". In any context in which an "or" list would be disjunctively distributive, intersubstitution between "either A" and "both A's" would produce either a change of sense or a syntactically eccentric construction. For example, in the context "You may do (   )", the list "a_1 or a_2" would be conjunctively distributive. The sentence "You may do a_1 or a_2" is true iff the sentence "You may do a_1 and you may do a_2" is true. This sentence is true iff "You may do either A" is true. It is logically objectionable here to move from the sentence "You may do either A" to the sentence "You may do both A's" for precisely the same reason why it is logically objectionable to move from the sentence "You may do a_1 or a_2" to the sentence "You may do a_1 and a_2". In the context "(   ) is sick", an "or" list would be disjunctively distributive. The sentence "a_1 or a_2 is sick" is true iff "a_1 is sick or a_2 is sick". It is not logically objectionable to move from the sentence "Either A is sick" to "Both A's are sick" or _vice versa_, but the sentence "Either A is sick" is syntactically odd. At this point I do not want to claim that we can generalize from this to an account of the difference between "either" and "both" according to which, for any context "Λ(   )", "Λ(either A)" is true iff "$\Lambda(a_1)$ & $\Lambda(a_2)$" is true, and "Λ(both A's)" is true iff "Λ(a_1 and a_2)" is true. Such an account ignores the fact that for some contexts "Λ(both A's)" is true iff "$\Lambda(a_1)$ & $\Lambda(a_2)$" is true, and the fact that for some contexts "Λ(either A)" is syntactically odd. It neglects the fact that it is frequently for those contexts in which "a_1 and a_2"

is undistributive that "either A" comes into use. For the moment, I want merely to see what can be said about the "either-both" distinction if this sort of account is given.

11. It becomes immediately apparent that if these equivalences hold, and if these equivalences express the difference between "either" and "both", then there is a precise analogy between the "either-both" distinction and the "any-every" distinction, at least as Geach has expressed this latter distinction. According to Geach, the distinction between "any" and "every" is expressed by the following pair of equivalences:

"f(any A)" is true iff "$f(a_1)$ & $f(a_2)$ & $f(a_3)$ &..." is true.

"f(every A)" is true iff "f(a_1 and a_2 and a_3 and...)" is true.

If this and the previous pair of equivalences hold, then the expressions "either A" and "both A's" differ from the expressions "any A" and "every A" just in that while the latter pair of expressions are used in speaking about the whole set of A's, the former are used in speaking about two members of the set of A's. If the "either-both"/ "any-every" analogy is thorough-going, then the expression "any A" ought to be related to an exhaustive, conjunctively distributive "or" list of A's in precisely the way that"either A" is related to a two-termed conjunctively distributive "or" list of A's. And "every A" ought to be related to an exhaustive "and" list of A's in the way that "both A's" is related to a two-termed "and" list of A's. We will find a correlation between the naturalness of "any A" in a context and the undistributiveness of an "and" list in that context, and consequently, we will find a correlation between the naturalness of "any A" in a context and the conjunctive distributivity of an "or" list in that context.

It is significant that when Geach sets out to show the correctness of his method of making the "any-every" distinction, he does so by putting the distinction to work with a sentence pair for which this correlation holds.

1. Tom can lawfully marry any sister of Bill's
2. Tom can lawfully marry every sister of Bill's

(1) he claims is true iff the sentence "(Tom can lawfully marry Mary) and (Tom can lawfully marry Jane) and (Tom can lawfully marry Kate)" is true. (2) is true iff "Tom can lawfully marry Mary and Jane and Kate" is true. The same equivalences

hold for the corresponding "either-both" pair of sentences. If Bill has only two sisters, Mary and Jane, then "Tom can lawfully marry either sister of Bill's" is true iff "(Tom can marry Mary) and (Tom can marry Jane)" is true. The sentence "Tom can marry both sisters of Bill's" is true iff the sentence "Tom can marry Mary and Jane" is true. But although this is undoubtedly the correct account of the difference between the members of these sentence pairs, we can construct a pair of sentences one of which contains "any" or "either" and the other of which contains "every" or "both" for which this distinction cannot be made. Where "Λ(   )" is the context "Tom has just married (   )" rather than "Tom can lawfully marry (   )", then

"Λ(any A)" is true iff "$\Lambda(a_1)$ & $\Lambda(a_2)$ & $\Lambda(a_3)$ &..." is true, and

"Λ(every A)" is true iff "$\Lambda(a_1)$ & $\Lambda(a_2)$ & $\Lambda(a_3)$ &..." is true. There is, however, one difference between these sentences which has been ignored by most writers. It is that whereas the sentence "Tom has just married every sister of Bill's"simply means "(Tom has just married Mary) and (Tom has just married Jane) and (Tom has just married Kate)", the sentence "Tom has just married any sister of Bill's" does not <u>simply</u> mean this. We <u>have</u> to give this account of this sentence if we are going to give any account of it at all. We are in the situation that we would be in if a foreigner were to say "I like your three sisters. If I were younger, I would want to marry both of them". We say "He must mean '...all of them'" and treat his remark as if he had said this. The sentence "Tom has just married any sister of Bill's" is an unnatural form of speech. This could have been predicted on the basis of the correlations that were claimed in the previous section. The context "Tom has just married( )" is a context in which an "or" list would be only disjunctively distributive, and therefore we would expect that the expression "any A" or "either A" in this context would be unnatural. On the other hand, the context "Tom can lawfully marry( )" is a context in which an "or" list would be conjunctively distributive, and in this context, we expect an expression of the form "either A" or "any A" both to be a natural form of speech, and to require an account different from the account required by "both A's" or "every A" in this context.

12. As we saw above, if "$\wedge$( )" is the con-

text "Tom can lawfully marry( )", then the account that we give of "Λ(every A)" is different from the account that we give of "Λ(any A)". If "Λ( )" is the context "Tom has just married( )", then "Λ(any A)" and "Λ(every A)" demand the same account. This fact can be brought out in the following way. We re-write "Tom can lawfully marry..." as "It is permitted that Tom marries...". We represent "It is permitted that " by "P" and "Tom marries" by "t". Then we write "P(t(every A))" for "Tom can marry every sister" and "P(t(any A))" for "Tom can marry any sister". The following equivalences appear to hold:

"P(t(every A))" is true iff "P(t(a_1) & t(a_2) & t(a_3) &..."

is true, and

"P(t(any A))" is true iff "P(t(a_1)) & P(t(a_2)) & P(t(a_3)) &..." is true.

The difference between this and Geach's account is that Geach has built both "P" and "t" into a single operator "f", and the fact that "P" is not distributive over "a_1 and a_2 and a_3 and..." precludes the distribution of "f" over this list. According to Geach, the difference between "f(any A)" and "f(every A)" is that the former is equivalent to the conjunction of predications of "f" of the A's severally, and the latter is equivalent to the predication of "f" of the conjunction of the A's. It becomes apparent from what has been said above that although it may be true that "f(every A)" is always equivalent to the predication of "f" of the conjunction of the A's, sometimes the sentence consisting of "a_1 and a_2 and a_3 and..." occurring in a context consisting of predicable "f" is equivalent to the conjunction of predications of "f" of the A's severally. To set out the difference between "f(every A)" and "f(any A)" as the difference between "f(a_1 and a_2 and a_3 and...)" and "f(a_1) & f(a_2) & f(a_3) &..." is, for this reason, inadequate.

In a paper entitled "'Any' and 'Every'" (Analysis 24, (March, 1964)), Robert Stoothoff suggests a scheme for distinguishing between "any" and "every" statements that uses the notion of the scope of proposition-forming operators. The difference between "g(any F)" and "g(every F)", he claims, is the difference between "(x)(Fx→dGx)" and "d(x)(Fx→Gx)" where "dGa" is equivalent to "g(a)". Thus, he exhibits the difference between "Tom won't come any day next week" and "Tom won't come every day next week" as a difference in scope of the negative operator "~" in "(x)(Dx → ~Ctx)" and "~(x)(Dx → Ctx)" which are read, respectively, as "For every x, that x is a day next week implies that Tom will not come on x" and "It is not case that for every x, that x is a day next week implies that Tom will come on x". Similarly, he claims, the difference between "Tom is willing to come any day next week" and "Tom is willing to come every day next week" can be exhibited as the difference between "(x)(Dx $\rightarrow$ WtCtx)" and "Wt(x)(Dx $\rightarrow$ Ctx)". He goes on to show that this account is viable for every pair of "any" and "every" statements, no matter how complicated. One of his conclusions is the following:

> In particular, the logical fallacy contained in arguments of the pattern "Any F may be G/∴ Every F may be G" should be regarded as the result of ignoring the scope of the modal word "may", not merely as a result of confusing "any" and "every". (p.157)

Disregarding the difficulty that attaches to the notion of 'the scope of the modal word', Stoothoff's conclusion comes closer to the truth than Geach's account would permit us. It contains the important point that it is the presence of certain proposition-forming operators that makes the confusion of "any" and "every" logically objectionable. It misses, however, the important point that it is only in the presence of certain proposition-forming operators that "any" comes into use at all.

III

13. In this section I want to examine some of the consequences of giving as an account of the distinction between "any" and "every", the following pair of equivalences:

"Λ(any A)" is true iff "Λ(a_1 or a_2 or a_3 or...)" is true.

"Λ(every A)" is true iff "Λ(a_1 and a_2 and a_3 and...) is true.

In particular, I shall consider the consequences that "any" must undergo something like a change of meaning between different contexts if it is always to be replaceable by an "or" list. I shall try to show that even when the scope account seems to provide an alternative to the claim that the meaning of "any" has changed, there are, nevertheless, considerable grounds for claiming that the account in terms of "or" is the correct one. In addition, I shall give examples of contexts in which the scope account cannot even be considered in the running.

One might suppose that the possibility of translating a sentence containing the expression "any A" into a sentence containing a list of the form "a_1 or a_2 or a_3 or..." depends upon that sentence's being one in which an "or" list is conjunctively distributive.

But this is not the case. In fact, the translatability of "any A" into "a_1 or a_2 or a_3 or..." depends upon such a list's being sometimes conjunctively distributive and sometimes disjunctively distributive. We can translate the sentence "You may have any A" into "You may have a_1 or a_2 or a_3 or...", because in the context "You may have( )", the list "a_1 or a_2 or a_3 or..." is conjunctively distributive, but if we translate the sentence "If any person wants to go, then he may do so" into the sentence "If p_1 or p_2 or p_3 or... wants to go, then he may do so", then we have substituted for "any A", an "or" list which is disjunctively distributive in respect of the context "( )wants to go". If the "or" list were conjunctively distributive in respect of "( ) wants to go", then distribution would result in a propositional conjunction over which "If_____, then he may do so" would not be conjunctively distributive. But the sentence "If p_1 or p_2 or p_3 or...wants to go, he may do so" is equivalent to the sentence "(If p_1 wants to go, then he may do so) & (if p_2 wants to go, then he may do so) & (if p_3 wants to go, then he may do so) &...", so "p_1 or p_2 or p_3 or..." must be disjunctively distributive in respect of "( ) wants to go".

It may be objected that if the account of "any" according to which any expression of the form "any A" is translatable into a list of the form "a_1 or a_2 or a_3 or..." requires that the distributive properties of this list change from context to context, then this is tantamount to claiming that the meaning of "any" changes from context to context. Such an account lacks the elegance of an account in terms of scope either of "any A" or of the proposition-forming operators which attach to "any A". The question arises: even if it is permissible English to translate a sentence containing "any A" into a sentence containing "a_1 or a_2 or a_3 or...", what progress have we made by bringing this fact into the discussion of "any" and "every". The fact that this translation is possible seems singularly unhelpful as an account of "any" since the "or" list would have to be conjunctively distributive in some contexts and disjunctively distributive in others. According to the scope account, the change in meaning of "any" is apparent only. According to the "or" account, the change of meaning seems to remain. Part of the grounds for saying that the meaning of "any" does not change is that the end result of an analysis of sentences containing "any X" is always the same, i.e., is always propositional conjunction. This can be seen by consideration of the two sentences:

(1) You may do any A

(2) If any member contributes, I'll shake his hand

If we use "P" to represent "You may do", (1) can be expressed as "P(any A)" which is equivalent to "$P(a_1)$ & $P(a_2)$ & $P(a_3)$ &...". Using "M" for the general term "member", "C" for"contributes" and "q" for "I'll shake his hand", (2) can be represented as "If C(any M), then q", which is equivalent to "$\{$If $C(m_1)$, then q$\}$ & $\{$if $C(m_2)$, then q$\}$ & $\{$if $C(m_3)$, then q$\}$ &...". The fact that this latter sentence is equivalent to "If $C(m_1)$ v $C(m_2)$ v $C(m_3)$ v..., then q", and therefore is equivalent to "If C(m_1 or m_2 or m_3 or...), then q" is irrelevant according to the scope account. In "If C(any M), then q", the scope of "any M" is "If C_____, then q", and the predication of any M of "If C_____, then q" is equivalent to the conjunction of the predications of "If C_____, then q" of the M's severally. Since every sentence in which "any X" occurs is equivalent to a propositional conjunction, no new clarity is gained by insisting that expressions of the form "any A" can be translated into "or" lists of A's some of which are conjunctively distributive and some of which are disjunctively distributive. The "or" account introduces unnecessary logical scaffolding to support a conclusion that is already adequately supported by the more elegant notion of scope.

I will reserve comment on the question whether the "or" account involves postulating a change of meaning either of "or" or of "any". For the present, I will restrict myself to showing that although this account lacks the superficial elegance of the scope accounts, nevertheless, it takes into account a number of facts that have not been taken into account by either of the scope theses examined.

14. What is required is an instance of a sentence containing the expression "any A" for which the "or" account leads us to a conclusion that is both correct and different from the account that the scope thesis implies. I shall try to provide examples of such sentences.

One of the examples which Russell uses in The Principles of Mathematics is: "If you met Brown or Jones, you met a very ardent lover". About this example, Russell says:

> The combination of Brown and Jones here indicated is the same as that indicated by either of them. It differs from a disjunction by the fact that it implies and is implied by a statement concerning both; but in some more complicated instances, this mutual implication fails. (p.57)

Since the sentence "If you met any suitor of Miss Smith, you met a very ardent lover" is equivalent both to "If you met Brown or Jones, you met a very ardent lover" and to the conjunction of "If you met Brown, you met a very ardent lover" and "If you met Jones, you met a very ardent lover", Russell concludes that the kind of conjunction by which any is defined "seems half-way between a conjunction and a disjunction" (P of M. p. 57). Geach reacts to this in the following way: First he claims:

> If this difficulty arose at all, it would have arisen in the propositional calculus, independently of any referring phrase's being used. "If p or q, then r" is equivalent to "(If p, then r) and (if q, then r)"; but this gives no warrant for the idea that the "or" in "if p or q" is a peculiar connective 'half-way between a conjunction and a disjunction'.
> (R&G p. 78)

It is clear from what has been said above (p. 57.ff.) that the one place where it is certain that this difficulty would not arise is in the propositional calculus. This is so because the sort of conjunction by which Russell is claiming "any" is defined is not a sort of propositional conjunction. The "or" which Russell is claiming is a peculiar connective is an "or" by which lists of proper names are constructed, not the "or" by which disjunctive propositions are constructed. There is, however, no warrant for supposing that this "or" is a peculiar sort of connective, or for supposing that it is half-way between conjunction and disjunction. Geach continues:

> For the rest, Russell's perplexity depends upon his ignoring the scope of referring phrases... the scope of the referring phrase in ["If you met any suitor of Miss Smith, you met a very ardent lover"] is "If you met _____, you met a very ardent lover" (Ibid p. 78)

Thus the sentence "If you met any suitor of Miss Smith, you met a very ardent lover" conforms to the propositional conjunction pattern of less complicated "any" sentences. It is a curious fact that Geach's explanation of this fact includes reference to the fact that "If p or q, then r" is equivalent to "(If p, then r) and (if q, then r)". He says:

> ...precisely because the "any" phrase has a long scope, and because "If p or q, then r" is equivalent to "(If p, then r) and (if q, then r)", ["If you met any suitor of Miss Smith, you met a very ardent lover"] corresponds to a conjunction of the results of inserting "Brown" and "Jones" instead of the "any" phrase...(Ibid p.78)

By the second "because" clause, he must mean "because 'If you met any suitor of Miss Smith, you met a very ardent lover" is equivalent to "If you met suitor #1 or you met suitor #2 or you met suitor #3 or... you met a very ardent lover" and this latter is equivalent to "(If you met suitor #1, you met a very ardent lover) and (if you met suitor #2, you met a very ardent lover) and (if you met suitor #3, you met a very ardent lover) and...". But the equivalence of the first two of these sentences has not so far entered into his explanation of this "any" sentence, and it is difficult to see how, on his view, this equivalence is helpful at all. Indeed, on Geach's view, one would have thought, it is not because "If p or q, then r" is equivalent to "(If p, then r) and (if q, then r)" that "If you met any suitor of Miss Smith, you met a very ardent lover" is equivalent to "(If you met suitor #1, then you met a very ardent lover) and (if you met suitor #2, you met a very ardent lover) and...". Rather, it is because these latter two sentences are equivalent that "If you met any suitor, you met a very ardent lover" is equivalent to "If you met suitor #1 or you met suitor #2 or you met suitor #3 or..., then you met a very ardent lover". This last equivalence seems just irrelevant.

When emphasis is put on the word "any" in the spoken sentence "If you met any suitor of Miss Smith, you met a very ardent lover", the sentence seems to fall immediately into a propositional conjunction. But the same is true of the sentence "If you met Brown or Jones, you met a very ardent lover" when the main emphasis is put on the word "or". That this is so does not establish that the reason why the sentence is equivalent to a propositional conjunction is that"you met Brown or Jones" is equivalent to "you met Brown or you met Jones". It remains a possibility that the reason why "any A" is tolerated here in the place of a disjunctive list is that the sentence is equivalent to a propositional conjunction.

Geach's final conclusion is:

> There seems as little warrant for Russell's saying that in 'complicated cases' there is no longer an equivalence between a predication about <u>any</u> so-and-so and the conjunction of corresponding predications about the several so-and-so's. (<u>Ibid</u> p. 79)

Put this way, Geach's view seems unquestionable. A predication about any so-and-so must certainly be equivalent to the conjunction of corresponding predications about the several so-and-so's. This is to say, any sentence of the form, "Any A is f" is equivalent to a sentence of the form "(a_1 is f) and(a_2 is f) and (a_3 is f) and...". Furthermore, if, in any conditional sentence in which an expression of the form "any A" occurs in the antecedent clause, the scope of the "any A" expression is the whole of the conditional sentence, then any conditional sentence can be regarded as a predication about <u>any</u> A. I shall examine the notion of scope later. For the present, I want to provide some examples of conditional sentences having antecedent clauses containing "any", for which the equivalence with propositional conjunction is questionable, or at least tangential to the sense of the sentence. These examples are interesting for several reasons: (a) because they must raise serious doubts about the doctrine that there is always a simple correlation between sentences containing "any" phrases and propositional conjunction; and (b) because they create problems for Quine's view that distinctive scope connotation is "the reason for joint survival of the apparent synonyms 'any' and 'every'" (W&O p.139); and (c) because they tend to confirm the account of "any" in terms of "or" lists which I am defending.

15. In Word and Object, Quine presents the following opinion:

> "If any member contributes, I'll be surprised"... asserts of every member that if he contributes, I'll be surprised. (p. 139)

I shall claim that this is not strictly true, or at least it is not true in the way that the sentence "If any member contributes, I'll shake his hand" asserts of every member that if he contributes, I'll shake his hand. I shall claim that this fact counts against the view that the difference between "any A" and "every A" can always be explained in terms of a difference in demanded scope. There is an important difference between the sentences

(1) If any member contributes, I'll be surprised

and

(2) If any member contributes, I'll shake his hand

(2) does not admit of qualification by the addition of "of course, I won't shake m_2's hand even if he does contribute". If there is a member whose hand I won't shake under any circumstances, then (2) is not strictly true. On the other hand, (1) is compatible with the qualification "of course, if m_1 contributes, I shan't be surprised if m_2 contributes". The same point can be put in this way. If I have said, "If any member contributes, I'll shake his hand", then the fact that m_3 has made a contribution provides grounds for predicting that I will shake m_3's hand. But even if I have said, "If any member contributes, I'll be surprised", the fact that m_3 contributes provides no grounds for predicting that I will be surprised. Of course, <u>as things now stand</u>, (a) being the case, if m_3 contributes, then I'll be surprised, just as, as things now stand, if m_1 contributes, I'll be surprised, and so on, exhausting the list of members. But this gives us no grounds

for saying that m_1 having contributed, I'll be surprised if m_2 contributes; it is only if, things being as they are, m_2 contributes that there are grounds for predicting that I shall be surprised. Thus, the statement "If any member contributes, I'll be surprised" does not, as Quine claims, assert of every member that if he contributes, I'll be surprised. At most, it asserts of every member, that, as things now stand, if he contributes, I'll be surprised.

The sentence "If any member contributes, I'll be surprised" is one in which the relevance of the substitutability of an "or" list for "any A" to the sense of the sentence can be shown very simply. Suppose that there are four members; m_1, m_2, m_3, m_4. For "m_1 contributes" I write "$C(m_1)$" and for "I'll be surprised" I write "S". Substituting an "or" list of members for "any member", the sentence "If any member contributes, I'll be surprised" can be written

If $C(m_1$ or m_2 or m_3 or $m_4)$, then S

It is equivalent to

If $C(m_1)$ v $C(m_2)$ v $C(m_3)$ v $C(m_4)$, then S

Writing "H" for I'll shake his hand", (2) can be written

If $C(m_1)$ v $C(m_2)$ v $C(m_3)$ v $C(m_4)$, then H

One might feel inclined to insist that since it is a law of logic that a sentence of the form "If p or q, then r" is equivalent to "If p, then r and if q, then r", these sentences are of identical logical form, each of them being equivalent to a conjunction of conditional sentences. I shall try to show at a later stage that the conjunction that results from distribution is different in character for each of these two sentences. At present, I shall try to show why distribution is less straightforward in the former of these sentences than in the latter. The reason why the sense of the second seems to be dependent upon the distribution of "If____, then H" over the antecedent clause is that, as Quine points out, if we do not distribute, we leave the word "his" in "I'll shake his hand" high and dry. The reason why distribution is, at least, not essential to the sense of the former sentence can be seen by replacing "If____, then S" by "That ____will surprise me". The sentence "If $C(m_1)$ v $C(m_2)$ v $C(m_3)$ v $C(m_4)$, then I'll be surprised" becomes "That $C(m_1)$ v $C(m_2)$ v $C(m_3)$ v $C(m_4)$ will surprise me". This implies that, as things now stand, $C(m_1)$ would surprise me; that, as things now stand, $C(m_2)$ would surprise me; etc. The sentence provides grounds for predicting that if someone reports to me that $C(m_1)$, I will show surprise. But this is so only because that $C(m_1)$ implies that

$C(m_1) \lor C(m_2) \lor C(m_3) \lor C(m_4)$. I cannot, on this basis, express surprise on every subsequent occasion when it is reported to me that another member has contributed. A snowballing of contributions might even be expected. The fact that $C(m_1)$ changes things so far as my being surprised that $C(m_2)$ is concerned in a way that $C(m_1)$ does not change things so far as my shaking the hand of m_2 if he contributes is concerned. Without adding the qualification "as things now stand", the most that can be predicted on the basis of "If $C(m_1) \lor C(m_2) \lor C(m_3) \lor C(m_4)$, then S" is that if $C(m_2)$, then either I will be surprised or I will have had a surprise in the not-too-distant past. Thus, if we are to distribute "If____, then S" over "$C(m_1) \lor C(m_2) \lor C(m_3) \lor C(m_4)$", either we must strengthen the antecedent clause of each resulting conjunct by the addition of "...and no one else has contributed", or we must weaken the consequent clause of each resulting conjunct by the addition of "...or I will have been surprised". Again, if I have said, "If any member contributes, I'll be surprised", then I can be expected to show surprise even if I learn only that $C(m_1) \lor C(m_2) \lor C(m_3) \lor C(m_4)$, but having said "If any member contributes, I'll shake his hand", I cannot be expected to shake anyone's hand having learned only this much.

Part of the reason why "S" is not straightforwardly distributive over "$C(m_1)$ v $C(m_2)$ v $C(m_3)$ v $C(m_4)$" is that disjunctive surprises are, in some respects, like disjunctive beliefs and assertions. Just as one could assert or believe that p or q without asserting or believing that p or that q, one can be surprised that p or q without being surprised that p or that q. This fact provides an example of a sentence, less problematic than the one which we have been considering, which contains "any" and which is not equivalent to a propositional conjunction, namely, the sentence "I am surprised that any member has contributed" which is equivalent to "I'm surprised that $C(m_1$ or m_2 or m_3 or $m_4)$" which is equivalent to "I'm surprised that $C(m_1)$ v $C(m_2)$ v $C(m_3)$ v $C(m_4)$", but not to the conjunction of the results of attaching "I'm surprised that..." to each of the disjuncts.

We can express the distributional peculiarity of the sentence "If any member contributes, I'll be surprised" either by modification of each of the conjuncts resulting from distribution, or by setting out the propositions with which the resulting conjunction must be compatible. Using the operator "D" to represent "If____, then S", we can express the sentence "If any member contributes I'll be surprised" as "$D\{C(\text{any } M)\}$" which is true iff it is true that $D\{C(m_1 \text{ or } m_2 \text{ or } m_3 \text{ or } m_4)\}$ which is true iff it is true that $D\{C(a_1) \vee C(m_2) \vee C(m_3) \vee C(m_4)\}$. If this were straightforwardly distributive then this last expression would be true iff it were true that

$D\{C(m_1)\}$ & $D\{C(m_2)\}$ & $D\{C(m_3)\}$ & $D\{C(m_4)\}$

But this conjunction must be qualified by the addition of the statement to the effect that it is compatible with

"$\{$if $C(m_1)$, then $\sim(D\{C(m_2)\})$ & $\sim(D\{C(m_3)\})$ &...$\}$

& $\{$if $C(m_2)$, then $\sim(D\{C(m_1)\})$ & $\sim(D\{C(m_3)\})$ &...$\}$

&..."

It is instructive to compare this with the symbolic representation of the sentence "Tom can marry any sister of Bill's". We represented this sentence as "$P\{t(\text{any } A)\}$" which is true iff it is true that $P\{t(a_1 \text{ or } a_2 \text{ or } a_3)\}$ which is true iff it is true that $P\{t(a_1)\}$ & $P\{t(a_2)\}$ & $P\{t(a_3)\}$.

This conjunction is compatible with

"$\{$if $t(a_1)$, then $\sim(P\{t(a_2)\})$ & $\sim(P\{t(a_3)\})\}$

& $\{$if $t(a_2)$, then $\sim(P\{t(a_1)\})$ & $\sim(P\{t(a_3)\})\}$

& $\{$if $t(a_3)$, then $\sim(P\{t(a_1)\})$ & $\sim(P\{t(a_2)\})\}$" and often a sentence of the form "$P\{t(\text{any } A)\}$" carries this qualification by implication. (see above p. 52. ff). There is a striking similarity between the form of the conditional sentence and the form of the deontic sentence, but it would be misleading to place much weight upon the similarities. A comparison of these two sentences is useful more for the dissimilarities that it reveals. The most important dissimilarity for the present discussion is in the modification of sense that the qualification brings about. Whereas the sense of the qualification of the second sentence is such as to exclude the simultaneous performance of any two of $t(a_1)$, $t(a_2)$ and $t(a_3)$, the sense of the qualification of the former sentence is not such as to preclude my being surprised at the simultaneous occurrence of more than one of $C(m_1)$, $C(m_2)$, $C(m_3)$ and $C(m_4)$. This qualification merely excludes my being surprised at each occurrence. The difference between "If any member contributes, I'll shake his hand" and "If any member contributes, I'll be surprised" does not lie simply in the fact that the second is capable of qualification in the manner outlined. This difference is the result of a more basic difference having to do with the relation of tenses between antecedent and consequent clause. Before going on to make some preliminary observations about the notion of scope and then to examine another sort of conditional sentence having "any" in its antecedent clause, I shall briefly indicate how tense relativity affects the logic of the sentence "If any member contributes, I'll be surprised"

16. Only some conditional sentences are used to state the logical consequences of propositions. Only some conditionals are like

(1) If Robinson is a bachelor, then Robinson is a male

Other conditional sentences state the outcomes of actions, events, policies and occurrences. That is, some conditional sentences are like

(2) If it rains, the track will be slippery

and (3) If you persist in your attitude, you will cause resentment

In some non-logical conditional sentences there is a difference in tense between the antecedent clause and the consequent clause. But even in conditional sentences in which there is no grammatical difference in tense, such as

(4) If it rains, then we usually postpone the race

it is clear that the event introduced in the consequent clause (i.e., the postponement) is later in time than the event introduced in the antecedent clause (i.e., the rain). Logical conditional sentences like (1) can undergo tautological transformations such as transposition straightforwardly. (1) is equivalent to

(1') If Robinson is not a male, then Robinson is not a bachelor

Non-logical conditional sentences with tense differences usually require some adjustment of tense when undergoing this sort of transformation. For example, (2) becomes

(2') If the track is not slippery, then it will not have rained

In (2), the present tense of the antecedent clause carries with it the implication of a determinate time reference having as one limit, the time of the occurrence of the event mentioned in the consequent clause. This is an indication that the futurity of the consequent clause relative to the antecedent clause is a built-in feature of this sort of conditional sentence.

The fact that for some conditional sentences, the consequent clause is future relative to the antecedent clause affects the possibility for these sentences of undergoing certain transformations. Sometimes compensatory adjustments of tense must be made. But in some cases, such adjustments would be insufficient to save the sense of the original sentence. This is the case for a certain set of non-logical conditional sentences having disjunctive antecedent clauses.

In the propositional calculus, the formula "$(p \vee q) \rightarrow r$" is the equivalent to the formula "$(p \rightarrow r) \& (q \rightarrow r)$", and the ordinary language counterpart of this formula "If p or q, then r" is normally equivalent to "If p, then r and if q, then r". But when there is a difference in tense between the antecedent clause and the consequent clause special difficulties are introduced for this transformation. The question arises: is there any guarantee that if the tense of the consequent clause is future relative to that of the antecedent clause, then in the propositional conjunction resulting from distribution the consequent clause of each conjunct will be future relative to the antecedent clause of each conjunct in addition to remaining future relative to the antecedent clause of the original sentence? It is clear that sometimes this is the case. It is, for example, in the sentence

(5) If m_1 contributes or m_2 contributes or m_3

contributes, then he will be warmly congratulated

which is equivalent to

(5') If m_1 contributes, then he will be warmly congratulated and if m_2 contributes, then he will be warmly congratulated and if m_3 contributes, he will be warmly congratulated

The consequent clause "he will be warmly congratulated" is clearly future relative to each of "m_1 contributes", "m_2 contributes" and "m_3 contributes" even if these events do not occur simultaneously. But it is not so clear that the futurity of the consequent clause is preserved throughout the same transformation for the sentence

(6) If m_1 contributes or m_2 contributes or m_3 contributes, then I'll be surprised

If, in the sentence,

(6') If m_1 contributes, then I'll be surprised and if m_2 contributes, then I'll be surprised and if m_3 contributes, then I'll be surprised

the consequent clause of each conjunct is future relative to the antecedent clause of the same conjunct, then (6') is not equivalent to (6). For on the basis of (6') one can predict, under certain conditions, three occurrences of the event in the consequent clause. On the basis of (6), one can predict only one such occurrence. If Geach's view that in a sentence of the form "If F(any A), then g", the scope of "any A" is always "If f____, then g" is correct, then if there is any tense difference at all in such a sentence, then it will be between "g" and each of "$f(a_1)$", "$f(a_2)$", "$f(a_3)$" etc. "g" cannot be future relative to "f(any A)" because "f(any A)" is not propositional. The reason why, on this account, "f(any A)" is not a propositional expression when it occurs in the context "If____, then p", is this. According to Geach's account, the result of attaching a predicable to "any A" is to produce a sentence which is equivalent to a propositional conjunction. Since there is no other way of construing "f(any A)" as being a proposition than as the result of attaching the predicable "f" to "any A", if"f(any A)" is a proposition, then it is equivalent to a propositional conjunction. But if "f(any A)" is equivalent to a propositional conjunction, then the conditional sentence "If f(any A), then g" is not equivalent to a propositional conjunction. But since "If f(any A), then g" is equivalent to a propositional conjunction, "f(any A)" cannot be a propositional expression. It follows that the grammatical tense of the verb contained in "f" must merely represent the tense of the verb in the "f" of "$f(a_1)$", "$f(a_2)$" etc. of the resulting propositional conjunction. But the sentence "If any member contributes, I'll be surprised" provides an example of a sentence of the form "If f(any A), then g" in which the tense of the "g" is future relative to "f(any A)", and therefore provides an example of a sentence of this form in which the antecedent clause has propositional sense independently of the translation of the sentence into a propositional conjunction. The sense of this sentence is, moreover, such that the sense of the expression "f(any A)" must be disjunctive.

17. It is clear from the considerations that I have introduced, that either it is not always the case that there is an equivalence between a predication about <u>any</u> so-and-so and the conjunction of corresponding predications about the several so-and-so's, or else not every sentence containing an expression of the form "any A" can be represented as a predication about <u>any</u> so-and-so. As a result, it becomes difficult to accept the view that the difference between expressions of the form "any A" and "every A" can

always be accounted for solely or even partly on the basis of a difference in scope. In those cases where it is plausible to represent a sentence containing "any A" as being a predication about any A, it is plausible to introduce the notion of scope to show the difference between this sentence and the sentence that would result from substituting "every" for "any". The question as to the scope of "any A" is the question: how much of this sentence can be represented as a predication about _any_ A. It is plausible, for example, to suppose that the difference between the sentences "If any man sins, then God will be angry" and "If every man sins, then God will be angry". Using the device "it is true of...that..." we can translate the former sentence into "It is true of each man that if he sins, then God will be angry" and the latter sentence into "If it is true of each man that he sins, then God will be angry". The difference in scope will show up as the difference in the amount that occurs in the "that" clause of each translation. In the former sentence, what is being predicated of each man is "if he sins, then God will be angry"; what is being predicated of each man in the latter sentence is "he sins".

The notion of scope was introduced as an explanatory rather than as a merely descriptive move. Quine puts it

> Sentences (1) and (2) ["If any member contributes, he gets a poppy" and "If any member contributes, I'll be surprised"] were ambiguous for three instructive reasons. One is that (1) has 'he' in its second clause, with 'any member' as grammatical antecedent; we cannot take the scope of 'any member' as just the first clause of (1), on pain of leaving 'he' high and dry. A second reason is that 'every' by a simple and irreducible trait of English usage always calls for the shortest possible scope. A third reason is that 'any' always calls for the longer of two possible scopes. (<u>W&O</u> p. 139)

But counter-instances to this thesis are easily constructible. For example, in a certain context, the sentence "If any member can vote, then voting is no longer a privilege" makes sense only if we regard the scope of "any member" as being "any member can vote". For, if only members can vote, then it is a necessary condition of its being a privilege to vote that at least one member be permitted to vote. Moreover, conditional sentences in which this is true need not be conditional sentences in which it makes no difference whether "any" or "every" is used. So the short scope of "any" need not be just a consequence of giving "any" the sense of "every" or using "any" in a context in which "every" would normally be used. In the sentence "If any board-member can be delegated to make the decision, then decision-making is no longer to be the sole responsibility of that board-member who has been elected chairman", the presence of the word "can" makes intersubstitution between "any" and "every" logically objectionable. Using the "such that" device, we can translate the antecedent clause of the present sentence into "each board-member is such that it is possible that he should be delegated to make the decision". The same antecedent clause with "every" substituted for "any" would be translated into "it is possible that each board-member be delegated to make the decision". Even though the scope of neither "any board-member" nor "every board-member" extends beyond the antecedent clause, "any board-member" still has a longer scope than "every board-member". So "any A" has not simply borrowed the role of "every A" here, and in addition, "any A" does not seem to have the longest possible scope.

This is not the place to enter a detailed examination of the notion of scope. It will suffice for the present discussion to point out that there does not appear to be formulable any single statement about the scope-connotation of "any" which is true for every occurrence of "any", and if no statement is formulable, it is difficult to see how the behaviour of "any" can be explained in terms of any such logical property, even for the set of sentences for which there is a correlation between the presence of "any" and translatability into propositional conjunction. But in addition, for some sentences containing "any", there is no propositional conjunction or sentence containing a propositional conjunction into which translation can be made. One such sentence has already been mentioned, namely, "I'm surprised that any member has contributed". In addition, an example of a conditional sentence containing "any" in its antecedent clause has been given, for which the antecedent clause must have propositional sense independent of translation into propositional conjunction. In conclusion, I shall offer an example of a second sort of conditional sentence containing "any" in its antecedent clause for which this is true, and mention a further set of sentences in which "any A" is plausibly considered to be disjunctive in import.

18. One of the reasons Quine gave for claiming an equivalence between "If any member contributes, he gets a poppy" and the propositional conjunction asserting of each member that if he contributes he gets a poppy was that, if there were not this equivalence, then the pronoun "he" would be left high and dry.

It is partly the need to take into account references from the consequent clause to constituents of the antecedent clause that determine the account that we give of the antecedent clause. In sentences where no such reference is made, there is less justification for giving an account in terms of propositional conjunction rather than in terms of translatability of "any A" into a disjunctively distributive "or" list. We have seen that giving an account of "If any member contributes, I'll be surprised" in terms of propositional conjunction to the exclusion of recognizing the disjunctive import of the antecedent clause changes the sense of the original sentence. There are two ways in which reference can be made from the consequent to the antecedent clause, and these two ways are illustrated by the following pair of sentences:

(1) If Fred tells me a story, I'll believe it

(2) If Fred touches my whisky, I'll know it

In (1), the referent of "it" is "story"; in (2) the referent of "it" is the whole content of the antecedent clause. If the reference of "it" is not clear, one can find out by asking "What will you believe?" or "What will you know?" and the answer to this question will make the reference clear; "I'll believe the story" or "I'll know that Fred has touched my whisky". (The change of tense here is not important - we could change (2) to "If Fred has touched my whisky..." without changing its sense). But when the reference of "it" is to the entire content of the antecedent clause, the answer that this question brings tells us more than the reference of "it". It can give an indication of the sense of the antecedent clause. This fact is useful in trying to determine the sense (if any) of an antecedent clause containing "any". Consider the sentence

If any guest touches my whisky, I'll know it

A possible(and the most plausible)answer to the question "What will you know?" is"I'll know that some guest has touched my whisky". In saying "I'll know it if any voter votes for me", a candidate would be claiming, not that he will know the identity of his supporters, but that he will know it if he has some. Suppose that there are three guests: g_1, g_2 and g_3. The sentence "If any guest touches my whisky, I'll know it" is, then, equivalent to a three-termed conjunction of sentences predicating something-or-other of g_1, g_2 and g_3, but it is not equivalent to the three-termed conjunction.

If $T(g_1)$, then k and if $T(g_2)$, then k and if $T(g_3)$ then k where "T" represents "has touched my whisky", and "k" represents "I'll know it". For if the sentence "If g_1 has touched my whisky, then I'll know it" has the sense that it would have as a sentence of normal English, then the referent of "it" is "g_1 has touched my whisky". But if the referent of "it" in the consequent clause of each conjunct is the content of the antecedent clause of each conjunct, then if the original sentence is equivalent to this three-termed conjunction of conditional sentences, then in making the claim that he will know it if any guest touches the whisky, one is claiming that no matter which guest touches the whisky, he will know the identity of the culprit. But this is surely outside the normal sense of the sentence "If any guest touches my whisky, I'll know it". In order to obtain a three-termed propositional conjunction that is equivalent to the original sentence, we must substitute for "it" in such a way that what we substitute for it can recur in the consequent clause of each of the three terms of the conjunction. A three-termed conjunction which would be equivalent to the original sentence "If any guest touches my whisky, I'll know it" would be, assuming that there are only the three guests g_1, g_2 and g_3, is the following:

If $T(g_1)$, then I'll know that $T(g_1) \vee T(g_2) \vee T(g_3)$
& if $T(g_2)$, then I'll know that $T(g_1) \vee T(g_2) \vee T(g_3)$
& if $T(g_3)$, then I'll know that $T(g_1) \vee T(g_2) \vee T(g_3)$

The fact that the three-termed propositional disjunction "$T(g_1) \vee T(g_2) \vee T(g_3)$" is the proper substitution for "it" here, shows that, in this instance anyway, the antecedent clause is propositional and disjunctive. And since this three-termed disjunction is equivalent to "$T(g_1$ or g_2 or $g_3)$" there is considerable ground for claiming that "any guest" in this context, takes the place of a disjunctive list of guests.

In this section, I have examined three types of conditional sentence having "any" in the antecedent clause. In the first of these types, of which the sentence

If any member contributes, I'll shake his hand

is an example, the fact that it is straightforwardly translatable into a propositional conjunction makes it difficult to argue that the phrase "any member" takes the place of a disjunctively distributive "or" list of members. To have argued on the basis of the equivalence of this sentence to the sentence in which "any member" is replaced by a disjunctively distributive list of members that here, the logical role of "any" is the same as the logical role of a disjunctively distributive "or" list would have been to invite the charge of committing the cancelling-out fallacy.

Conditional sentences of the second type, of which the sentence "If any member contributes, I'll be surprised" are not so straightforwardly translatable into propositional conjunctions, and yet which are equivalent to conditional sentences having disjunctive antecedent clauses. Moreover, the sense of these sentences is such that the antecedent clause must have propositional sense independent of the equivalence of the sentences to propositional conjunctions. Since these sentences are equivalent to conditional sentences having disjunctive antecedent clauses independently of either sort of sentence being equivalent to propositional conjunction, it is difficult to accept that they are not equivalent in virtue of equivalent antecedent clauses and identical consequent clauses.

The third sort of conditional sentence that was examined had a consequent clause in which reference was made to the content of the antecedent clause. In order to translate such conditional sentences into equivalent conjunctions of conditional sentences, it was necessary to substitute an expression for the referring word of the original consequent clause in order to make clear that reference was to the original antecedent clause of the member of the resulting conjunction. The expression substituted revealed that the original antecedent clause was disjunctive.

19. Despite the fact that there are strong indications that there is a difference in logical role between "any" in "You may have any A" and "If f(any A), then g", one might want to maintain that it is only because the conditional sentence is equivalent to a propositional conjunction that "any A" is tolerated in the place of a disjunctively distributive list, and it is an extension of this use of "any" that it occurs in conditional sentences that are not equivalent to propositional conjunctions, or in conditional sentences of which the antecedent clause has a disjunctive sense. But there are separate considerations which make such a position difficult to maintain. That is, expressions of the form "any X" sometimes stand in the place of disjunctively distributive lists where there is no equivalence with propositional conjunction. I shall merely list some sentences in which this is the case.

(1) The sentence "I asked whether any voter had supported me", in some contexts (such as when we know

the names of the voters), has the same force as the sentence "I asked whether v_1 or v_2 or v_3 or...had supported me", but never has the same force as the propositional conjunction "I asked whether v_1 had supported me and I asked whether v_2 had supported me and I asked whether v_3 had supported me and..."

(2) "I'm surprised that any member has contributed" which in some contexts has the same force as "I'm surprised that m_1 or m_2 or m_3 or...has contributed", but never has the same force as "I'm surprised that m_1 has contributed and I'm surprised that m_2 has contributed and I'm surprised that m_3 has contributed and..."

(3) The interrogative sentence "Did any member contribute?" which is equivalent to "Is it the case that m_1 or m_2 or m_3 or...contributed?" but which is not equivalent to a conjunction of questions such as "Did m_1 contribute and did m_2 contribute and did m_3 contribute?" The interrogative introduces a peculiar problem, since on some occasions, a question of the form "Does a_1 or a_2 or a_3 ϕ?" collects the answer "a_1 ϕ's" or "$a_2\phi$'s" and sometimes such a question collects the answer "Yes" or "No". However, when it collects an answer which says which of a_1, a_2 and a_3 ϕ's, it implicity collects a "Yes" or "No"

answer. Sometimes in answering a question of the form "Does any A ϕ", one goes on to say which A ϕ's, but to do so implies a "Yes" answer. To say that these questions are equivalent is just to say that the same "Yes" or "No" answer must be given to both of them, and the state of affairs in virtue of which one of these is the correct answer to one of the questions is the same state of affairs that makes this answer the correct answer to the other question.

In this chapter, I have tried to show two things: First that as a non-propositional connective, "or" fulfils, not one logical role, but two. And secondly, that "any" fulfils two logical roles which parallel those of "or". I do not think that for these reasons, it becomes appropriate to say that "any" and "or" undergo a change of meaning or mean different things in different contexts. This seems an extreme assessment of the situation. But it seems an equally extreme view that "any" and "or" always have the same meaning. As we have seen, if this latter view is the view that every sentence containing "any" and every sentence containing "or" is equivalent to a sentence of a single logical form, then the view is simply an incorrect one. The lesson is, I think, not that the correct account of "or" and "any" lies in between these extremes, but that the language of meaning is not particularly well suited to talking about words like "any" and "or". By saying that the word "meaning" is not useful in giving an account of "or" and "any", we have not dismissed out of hand Geach's discussion of "any" or the points he has made about changes of meaning. For if the notion of scope provides a means of avoiding the postulation that the meaning of "any" is different in different contexts, it does so by providing a means of regarding "any" as having the same logical role in every context. This effectively removes the necessity of making any claim that there is anything different about "any" in different contexts. Also, the arguments that Geach has used about arguments purporting to establish a difference in meaning in different contexts, if they are valid, apply also to arguments purporting to establish a change in logical role. In the following two chapters, I shall examine the notion of scope in relation to contexts in which it seems to be applicable and then consider the force of the argument by which Geach attempts to show that cancelling out is a fallacy.

CHAPTER THREE

20. Geach introduces the notion of scope in the following way:

> Let us suppose that a complicated proposition abbreviated as "f(*A)" contains a clause "g(*A)" as part of itself: then we shall in general have to distinguish between taking a referring phrase "*A" as the quasi subject of the whole of (the context abbreviated to) "f( )" and taking it as merely the quasi-subject of "g( )"; in the latter case we must treat only "g( )", not the whole of "f( )" as the scope of "*A". For example in (1) [if Jemima can lick any dog, then Jemima can lick any dog] the scope of the first "any dog" is "if Jemima can lick_____, then Jemima can lick any dog"; (1) expresses the supposition that this complex predicable is true of any dog. In (2) on the other hand [If Jemima can lick some dog, then Jemima can lick any dog] the proposition "Jemima can lick some dog" occurs as the antecedent, and the scope of "some dog" is merely the context "Jemima can lick_____". This difference in scope neutralizes the difference between them, so that (1) and (2) become practically the same.
> (R&G pp.66-67)

The point here is, that in the sort of situation described, namely where an expression "g(*A)" occurs as a constituent of a proposition "F{g(*A)}", the meaning of the proposition "F{g(*A)}" will generally depend upon whether we regard the scope of *A as being "g( )" or as being "F{g( )}". Quine makes the stronger claim for "any A" that in such a situation, the proper meaning of the sentence will always be obtained by regarding the scope of "any A" as being

"$F\{g(\quad)\}$" rather than as "$g(\quad)$". But both these claims are made on the assumption that any sentence of the form "f(any A)" is equivalent to a sentence of the form "$f(a_1)$ & $f(a_2)$ & $f(a_3)$ &...". Put in terms of this supposed equivalence, Geach's point is that generally, where a proposition "f(any A)" contains a clause "g(any A)", the meaning of the proposition "f(any A)" will be different depending upon whether we regard it as being equivalent to "$F\{g(a_1)$ & $g(a_2)$ & $g(a_3)$ &...$\}$" or as being equivalent to "$F\{g(a_1)\}$ & $F\{g(a_2)\}$ & $F\{g(a_3)\}$ &..." But sometimes where the context "$f(\quad)$" is such that these two latter propositions are inequivalent, the scope of "any A" must be regarded as being "$F\{g(\quad)\}$" only if we regard "$g(\quad)$" as a context for which "g(any A)" is equivalent to "$g(a_1)$ & $g(a_2)$ & $g(a_3)$ &...". Of course, if every context is such a context, then a fortiori, "$g(\quad)$" is such a context. But if "$g(\quad)$" were a context such that "g(any A)" is equivalent to "$g(a_1)$ v $g(a_2)$ v $g(a_3)$ v...", then for some contexts "$F\{g(\quad)\}$", the equivalence between "$F\{$g(any A)$\}$" and "$F\{g(a_1)\}$ & $F\{g(a_2)\}$ & $F\{g(a_3)\}$ &..." would hold even if the scope of "any A" were considered to be only "$g(\quad)$". Similarly, Quine's claim is that for every proposition of the sort described,

"$F\{g(\text{any } A)\}$" is equivalent to "$F\{g(a_1)\}$ & $F\{g(a_2)\}$ & $F\{g(a_3)\}$ &..." but is not equivalent to "$F\{g(a_1)$ & $g(a_2)$ & $g(a_3)$ &...$\}$". This claim would lose whatever plausibility it has but for the assumption that every sentence of the form "f(any A)" is equivalent to a conjunction of the predication of "f" of the A's severally. This claim simply disregards the fact that for some interpretations of "F" and "g", there is an equivalence between "$F\{g(a_1) \vee g(a_2) \vee g(a_3) \vee \ldots\}$" and "$F\{g(a_1)\}$ & $F\{g(a_2)\}$ & $F\{g(a_3)\}$ &...".

The same point about scope can be expressed in a different way. Both Geach and Quine assume that every sentence in which "any" occurs is equivalent to a propositional conjunction. The point that Geach is making is this: assuming that every sentence of the form "f(any A)" is equivalent to a sentence of the form "$f(a_1)$ & $f(a_2)$ & $f(a_3)$ &...", for some sentences containing "any A", we must determine whether they are sentences of the form "f(any A)" or sentences containing sentences of the form "f(any A)". Quine's point, expressed in this terminology would be that every sentence containing "any A" is a sentence of the form "f(any A)" and no sentence containing "any A" is merely a sentence containing a sentence of the form "f(any A)".

Conditional sentences containing "any" in their antecedent clauses are sentences for which the question of the scope of "any" arises. For a sentence of the form "If g(any A), then p", we must distinguish between taking the scope of "any A" as being "g(   )" and taking its scope as being "If g(   ), then p". If its scope is the former of these, then "g(any A)" is equivalent to "$g(a_1)$ & $g(a_2)$ & $g(a_3)$ &...", and therefore, the whole conditional sentence is equivalent to "If $g(a_1)$ & $g(a_2)$ & $g(a_3)$ &..., then p". That is, the conditional sentence is not a sentence of the form "f(any A)"; it is a sentence containing a sentence of the form "f(any A)". If the scope of "any A" is "If g(   ), then p", then the sentence is equivalent to "(If $g(a_1)$, then p) & (if $g(a_2)$, then p) & (if $g(a_3)$, then p) &...", and the sentence "If g(any A), then p" is a sentence of the form "f(any A)", i.e., is not merely a sentence containing a sentence of this form. If the only two scope-possibilities of "any A" in this context are "g(   )" and "If g(   ), then p", then since there is no equivalence between sentences of the form "If p & q, then r" and "If p, then r & if q, then r", the equivalence of the sentence "If g(any A), then p" to a sentence of one or the other of these forms establishes the scope of "any A" in this sentence. For example, if the sentence "If g(any A), then p" is equivalent to "(If $g(a_1)$, then p) & (if $g(a_2)$, then p) & (if $g(a_3)$, then p) &...", then "If g(any A), then p" is not equivalent to "If $g(a_1)$ & $g(a_2)$ & $g(a_3)$ &..., then p". So the scope of "any A" is not "g(   )"; so the scope of "any A" is "If g(   ), then p". Similarly, if "If g(any A), then p" is equivalent to "If $g(a_1)$ & $g(a_2)$ & $g(a_3)$ &..., then p", then the scope of "any A" is "g(   )". This demonstration over-simplifies the scope-possibilities of "any A", since, if the context "g(   )" contained a modal word such as "may" or "can", there would be a third scope-possibility. And indefinitely many scope-possibilities would be generated by constructing "g(   )" to be of the form "if h(   ), then q", and constructing "h(   )" to be of the form "if i(   ), then r", and so on. Such a construction would be highly artificial, but the formal possibility of constructing such a context should dissuade us from easy acceptance of Quine's view that "any" always calls for the longer of two possible scopes. The greater the complexity of context, the more numerous must be the contextual clues to the correct scope of "any". This cannot be pre-determined.

21. What is of interest for the present discussion, is first, the fact that although a sentence "g(any A)" might be equivalent to "$g(a_1)$ & $g(a_2)$ & $g(a_3)$ &...", a conditional sentence having this sentence as its antecedent clause would normally be taken to be equivalent to a conjunction of conditional sentences, not a conditional sentence having a conjunctive antecedent clause. This is of interest because this fact is paralleled by the fact that although a sentence "g(a_1 or a_2 or a_3 or...)" would normally be taken to be equivalent to "$g(a_1)$ & $g(a_2)$ & $g(a_3)$ &...", a conditional sentence having "g(a_1 or a_2 or a_3 or...)" as its antecedent clause would normally be taken to be equivalent to a conjunction of conditional sentences, and not to a conditional sentence having a conjunctive antecedent clause. That is, for some interpretations of "g",

"g(a_1 or a_2 or a_3 or...)" is true iff "$g(a_1)$ & $g(a_2)$ & $g(a_3)$ &..." is true, but

"If g(a_1 or a_2 or a_3 or...), then p" is true iff "$\{$If $g(a_1)$, then p$\}$ & $\{$if $g(a_2)$, then p$\}$ & $\{$if $g(a_3)$ then p$\}$ &..."

is true. That is, it is true iff "If $g(a_1)$ v $g(a_2)$ v $g(a_3)$ v..., then p" is true. So in the conditional sentence, "g(a_1 or a_2 or a_3 or...)" is not equivalent to a propositional conjunction. When this is the case, there are two ways in which we can account for the change that has taken place. First, we can say that although in the context "g( )", the list "a_1 or a_2 or a_3 or..." is conjunctive, in the context "If g( ), then p", this list is disjunctive. Secondly, we can say that the list is conjunctive in both cases, but in the conditional sentence is conjunctively distributive in respect of "If g( ), then p", whereas in the sentence "g(a_1 or a_2 or a_3 or...)" it is conjunctively distributive in respect of "g( )". This solution has obvious similarities with the solution of the corresponding problem with "any A". It has the advantage over the former alternative that it does not involve making the claim that "or" means one thing in one sentence and another thing in the other sentence. What considerations are relevant to deciding this issue? First, it is no real advantage that the account by which the "or" list is conjunctive in both instances does not involve claiming a difference of meaning, since it can be shown on quite separate grounds that "or" lists are sometimes conjunctively and sometimes only disjunctively distributive. Nor is there any advantage in saying that the "or" list in this context is conjunctive because this permits us to explain the logic of "any" in terms of translatability into appropriate "or" lists without claiming a change in the meaning of "any". This is so because there are quite separate reasons for the claim that "any" expressions are sometimes replaceable, without a change of sense, by disjunctively distributive lists.

An additional difficulty that arises for such a claim is this: if we say that in the conditional sentence "If $g(a_1$ or a_2 or a_3 or...), then p", the "or" list is conjunctive, just because this conditional sentence is equivalent to "(If $g(a_1)$, then p) & (if $g(a_2)$, then p) & (if $g(a_3)$, then p) &..." then we are bound to explain why the list "a_1 or a_2 or a_3 or..." should be construed as conjunctive in this conditional sentence and construed as anything other than conjunctive in a conditional sentence "If $h(a_1$ or a_2 or a_3 or...), then p" where "h" is such that the sentence "$h(a_1$ or a_2 or a_3 or...)" would normally be taken to be equivalent to a propositional disjunction. Expressing this in terms of meaning changes, we appear to be in the following position: either we must say that there is a change of meaning of "or" between "$g(a_1$ or a_2 or a_3 or...)" which is equivalent to "$g(a_1)$ & $g(a_2)$ & $g(a_3)$ &..."

and"If $g(a_1$ or a_2 or a_3 or...), then p" or we must say that there is a change of meaning between "$h(a_1$ or a_2 or a_3 or...)" which is equivalent to "$h(a_1) \vee h(a_2) \vee h(a_3) \vee$..." and "If $h(a_1$ or a_2 or a_3 or...), then p". If we claim that there is no change of meaning in the first of these, then to be consistent, we must claim that there is a change of meaning in the second; if, on the other hand, we claim that there is no change of meaning in the second case, it would be difficult to support the claim that there is no change of meaning in the first.

22. Because a sentence containing an "or" list is usually equivalent to a propositional disjunction, it seems more correct to say that in the conditional sentence "If $g(a_1$ or a_2 or a_3 or...), then p", "a_1 or a_2 or a_3 or..." is a disjunctive list, and that this sentence is equivalent to a conjunction of conditional sentences because of the properties of propositional disjunction and those of conditional sentences. Because "or" usually has this use, it seems an unnecessary complication to claim that the use of "or" here is a special conjunctive use, especially since a propositional conjunction results even if the list is just disjunctive. Similarly, it is the fact that

usually, a sentence containing "any" is equivalent to a propositional conjunction, that makes it seem more correct to say that in the conditional sentence "If g(any A), then p", "any A" has its normal sense, and that this sentence is equivalent to a conjunction of conditional sentences because of the scope of "any A". It seems unnecessary to suppose that there has been a change of sense here, since propositional conjunction results even on the assumption that no change has taken place. However, the situation is complicated by the fact that there are some contexts in respect of which "or" is conjunctively distributive, and in which it seems plausible to assume a special conjunctive use; and by the fact that there are sentences containing "any" which are not equivalent to propositional conjunctions and which are equivalent to sentences resulting from substitution of disjunctive "or" lists for the "any" expressions. Furthermore, it is true of most sentences containing "any" which are equivalent to propositional conjunction, that a sentence likewise equivalent to a propositional conjunction results from substitution of an "or" list for the "any" expression. And in most of these cases, at least, no plausible disjunctive sense of "or" seems possible. Now if this general substitutability is significant for the case of the conditional sentence--that is, if this general fact about "or" and "any" provides a sufficient ground for claiming that substitution ought to be possible here, then the question concerning a change of meaning of "any" is related to the question of a change of meaning of "or" in the following way: if we say that "any" has not changed its meaning between "g(any A)" and "If g(any A), then p", then we must say that "or" has not changed its meaning between "g(a_1 or a_2 or a_3 or...)" and "If g(a_1 or a_2 or a_3 or...), then p" and therefore has changed its meaning between "h(a_1 or a_2 or a_3 or...)" and "If h(a_1 or a_2 or a_3 or...), then p". If, on the other hand, we say that "any" has changed its meaning here, then we must say that "or" has changed its meaning between "g(a_1 or a_2 or a_3 or...)" and "If g(a_1 or a_2 or a_3 or...), then p". So, depending on the significance of the substitutability of "or" lists for "any" expressions, claiming that there is an extension of the scope of "any" between "g(any A)" and "If g(any A), then p" could involve claiming that there is a change in meaning of "or" between "h(a_1 or a_2 or a_3 or...)" and "If h(a_1 or a_2 or a_3 or...), then p".

But even if the general substitutability of "or" lists for "any" expressions does not warrant the supposition that this substitution can be effected in conditional sentences, the scope account of "any" in conditional sentences does not relieve us of the necessity of postulating a change of meaning. For even if the correct account of "any" in the sentence "If g(any A), then p" is that its meaning is precisely the same as it is in "g(any A)" neat, but its scope is not "g( )", but "If g( ), then p", nevertheless the meaning of "g(any A)" has changed. For "g(any A)" by itself is equivalent to "$g(a_1)$ & $g(a_2)$ & $g(a_3)$ &...", but to substitute this propositional conjunction for "g(any A)" in the conditional sentence would be to change the sense of the conditional sentence. So it seems that whatever account we choose, we are stuck with some change of meaning or other.

23. The preceding discussion raises the question: to what extent does the explanation of the equivalence of the sentence "If g(any A), then p" to "(If $g(a_1)$, then p) & (if $g(a_2)$, then p) & (if $g(a_3)$, then p) &..." lie in the scope of "any A" and to what extent in the fact that "If p or q, then r" is equivalent to "If p, then r and if q, then r"? If the explanation lies in this general equivalence, then the sentence which forms the antecedent clause of the original

conditional sentence seems to involve a rather queer use of "any". If it lies in the fact that "any" has a long scope here, then what constitutes the antecedent clause is not really a sentence at all, and in fact what looks like an antecedent clause is not really an antecedent clause at all, because the sentence is not really a conditional sentence--it is a disguised categorical sentence having a hypothetical predicate term. If we accept that there is a correlation between "any" and propositional conjunction, then this second explanation will be the one that we accept. There are, however, instances where the acceptance of this correlation does not provide an easy answer to this question. Consider, for example, the sentence "If p, then g(any A)". This sentence is equivalent both to "If p, then $g(a_1)$ & $g(a_2)$ & $g(a_3)$ &..." and to "(If p, then $g(a_1)$) & (if p, then $g(a_2)$) & (if p, then $g(a_3)$) &...". In this case, it makes no difference to the final interpretation that we put on the sentence whether we say that the scope of "any A" is "g(   )" or "If p, then g(   )". Since this is the case, it is difficult to see whether the reason that we must give for the equivalence between this conditional sentence and a conjunction of conditional sentences is: (1) that (a), "g(any A)" is equivalent to "$g(a_1)$ & $g(a_2)$ & $g(a_3)$ &..." and (b) a sentence of the form "If p, then q and r" is equivalent to a sentence of the form "If p, then q and if p, then r" or (2) that "If p, then g(any A)" is a sentence of the form "f(any A)" and is therefore equivalent to a sentence of the form "$f(a_1)$ & $f(a_2)$ & $f(a_3)$ &...". There seems no good reason why we should choose to say that "any A" has one scope rather than the other. If we say that the scope of "any A" is determined by the minimum amount of the sentence in which it occurs which can be considered as being a sentence of the form "f(any A)" and therefore equivalent to a propositional conjunction, then this seems to count against the claim that "any" always demands the longest possible scope. If, on the other hand, we say that the scope of "any A" is the maximum amount of the sentence in which it occurs which can be considered as being a sentence of the form "f(any A)" and therefore as being equivalent to a propositional conjunction, then we shall say that the scope of "any A" in this sentence is "If p, then g( )". This would have certain interesting consequences for one special instance of "If p, then g(any A)", namely "If g(any A)". It would, for example, be wrong to suggest that <u>the</u> form of the sentence was expressed by the paraphrase "It is true as regards any A that if it g's, then it is true as regards any A that it g's". This sentence could as well be paraphrased "It is true as regards any A, that if it is true as regards any A that it g's, then it g's". This does not necessarily constitute a problem for the claim that "any" always has the longest possible scope, since the scope of the occurrence of "any" which turns up in the predicate expression of each paraphrase could be considered to be the whole of each resulting conditional conjunct. That is, unpacking the first paraphrase into the conjunction "(If g(a_1), then g(any A)) & (if g(a_2), then g(any A)) & (if g(a_3), then g(any A)) &...", the scope of the first occurrence of "any A" could be considered to be "If g(a_1), then g( )", the scope of the second "if g(a_2), then g( )" and so on. In the conjunction resulting from the second paraphrase, the scope of the first occurrence of "any A" would be "If g( ), then g(a_1)"; the scope of the second "if g( ), then g(a_2)" and so on. This is the sort of solution which Geach offers for sentences containing more than one referring phrase. In this sentence it does not matter which referring phrase is unpacked first.

What has been said here about "any" holds as well for "either", and precisely the same problems with regard to scope and meaning arise for both "any" and "either" expressions. It is the fact that these words usually occur adjacent to grammatically nominal expressions that permits the notion of scope to be introduced in the form in which Geach and Quine introduce it. It is, that is, the fact that an expression of the form "any A" or "either A" is the sort of expression that can stand in the place of a grammatical subject, that permits the question to be raised as to how much of the sentence in which such an expression occurs can be regarded as a predicable attached to this expression.

24. It will help to put into perspective the questions arising concerning these words to compare "any" and "either" with other words which have similar apparently split personalities but for which the notion of scope is less obviously applicable (at least in the same way). Such a word is"ever". The main features that we noted as peculiarly characterizing "any" and "either" were (a) That it is only in special sorts of indicative context that they could occur without oddness; (b) that whereas normally sentences containing

them were equivalent to propositional conjunctions, sometimes they seem to have a disjunctive sense, namely in interrogatives and conditional sentences; and (c) that there is a general correlation between (1) a context's being both one in which "any" or "either" would occur normally and one such that the sentence consisting of "any A" or "either A" occurring in this context is equivalent to a propositional conjunction and (2) this context's being one in which an "and" list would be undistributive, or have an undistributive sense.

An examination of the use of the word "ever" would reveal that its logical behaviour in some ways parallels that of "any" and "either" and that the relation between "ever" and "always" is remarkably similar to the relation between "either" and "both" and that between "any" and "every". For example, outside of poetic effort and sermons, "ever" seldom occurs in indicative sentences. Normally, we would say "There is always a policeman on that corner", not "There is ever a policeman on that corner". The major difference between the situation here and the "any-every" and "either-both" distinctions is that there is no special set of indicative contexts for which the use of "ever" is reserved. It can be used in any context in which "always" can be used. But its use in these contexts is for a literary or poetic effect, not for a logically significant distinction.

There are, however, situations in which inter-substitution between "ever" and "always" produces logically significant changes of sense. These are in negative, interrogative, and conditional sentences. This can be seen from the following "ever-always" pairs.

(a) It is not <u>always</u> the case that p

(a') It is not <u>ever</u> the case that p

(b) Is it <u>always</u> the case that p?

(b') Is it <u>ever</u> the case that p?

(c) If it is <u>ever</u> the case that p, then q

(c') If it is <u>always</u> the case that p, then q

The differences between (a) and (a') and between (c) and (c') can be expressed by paraphrases in which only "always" is used, but in which its scope is varied. The difference between (a) and (a') is the difference between the following sentences:

(d) It is not the case that it is always the case that p

(d') It is always the case that it is not the case that p

The difference between (c) and (c') is the difference between

(e) It is always the case that if p, then q and (e') If it always the case that p, then q

We could, however, express the difference between all three of these pairs by substituting for "always" an "and" list of occasions and for "ever" an "or" list of occasions. In all of (a'), (b') and (c'), an "or" list would be disjunctively distributive. Moreover, since the use of "ever" in affirmative indicative contexts is archaic, we can say that for any normal use of "ever", it can be replaced by a disjunctive list of occasions.

Sentences containing "any" are sentences for which the addition of the negative particle "not" produces the contrary and not just the contradictory. "I cannot remember any poem" means "Every poem is one which I don't remember". But this is not peculiar to "any", nor even to "any", "either" and "ever". Sentences containing "should" "ought" "must" have the same property. But in addition, the addition of "not" to some sentences produces more than the contradictory even where it is difficult to say whether it produces the contrary and where it is difficult to make the notion of scope fit at all. For example, whereas "not very sick" means roughly "sick, but not very sick", "not very well" does not mean even roughly "well, but not very". This seems to be a general fact about the behaviour of "very". When "f" is a "con" adjective, "not very f" means roughly "f, but not very"; when "f" is a "pro" adjective, "not very f" means something slightly worse than "f, but not very". What is interesting about this general fact about the behaviour of "very" in the presence of "not" is that it cannot plausibly be said to illustrate the charity of human nature in that we tend toward understatement in ascribing unpleasant qualities and do not tend toward understatement in denying them. What we learn is, not that we should understate in certain circumstances, but that "not very well" without special sense-changing emphases, means something worse than "well, but not very". At what point does this cease to be an understatement and become instance of an autonomous use of "very"?

In this chapter I have been concerned with the possibility of giving an account of "or" and "any" which does not involve postulating a change of meaning. It has become clear that the notion of scope does not provide a means of giving such an account, and in fact, the acceptance of the scope account forces at least one change of meaning upon us. I tried to put the case of "any" into perspective by comparing it with that of "ever", where the temptation to apply the notion of scope is less compelling because "ever" is adverbial and because the only use of "ever" in which it cannot be replaced by a disjunctive list of occasions is now an archaic use. If "ever" can be regarded as subject to a historical process of specialization in which its use in affirmative indicative sentences is lost because it does not enable us to say anything that "always" and "forever" does not permit us to say, then "any" can be regarded as at least not immune to similar historical processes, but as having retained its use in those affirmative indicative contexts in which it enables us to make a vital distinction. In the following chapter, I want to examine one way in which Geach has sought to short-circuit the supposition that the word "any" means different things in different contexts.

CHAPTER FOUR

25. In this chapter, I want to assess the wisdom of some advice given by Peter Geach in Reference and Generality about the meaning of words. He says

> There is, to be sure, a strong temptation to say: In the context "If Jemima can lick ____, then Jemima can lick any dog", "any dog" means the same as "some dog", even though they mean different things from each other in other contexts. I think we should resist the temptation.

and again

> The expression "In the context of the propositions P_1, P_2, the meaning of E_1, E_2 is the same" is a muddling one: it may mean no more than that P_1, which contains E_1, means the same as P_2 which contains E_2 and is otherwise verbally the same as P_1; or it may seek to explain this by the supposition that here E_1 and E_2 mean the same, though perhaps not elsewhere... (p. 61)

Among other things, I shall try to see to what extent our response to this advice ought to be to refrain from using expressions like the quoted expression, and to what extent it ought to be to continue using them but to be careful not to become muddled by them.

The question whether a pair of expressions can be synonymous only sometimes, has obvious connexions with the question whether a word can mean one thing on one occasion and something else on another, since in contexts in which an expression E_1 is not synonymous with expression E_2, the meaning of E_1 must be different from the meaning of E_1 in contexts in which it is synonymous with E_2. If the meaning of a word is always the same, then there will be no pair of expressions such that they are synonymous in some contexts and not in others. There is another question which is related to these, and which I want to exclude from consideration. It is the question whether it is appropriate to speak about _a single word_ meaning one thing in one context and another thing in another context. This is not the question to which the token-type distinction is supposed to provide an answer. It is the question whether, if two expressions do not have the same meaning, they can be occurrences of the same word. One can, of course, load enough into the meaning of "word" to make it analytic that such occurrences would not be occurrences of the same word. But we do not normally do this. We sometimes want to distinguish between pairs of expressions which represent different uses of the same word, and pairs of expressions which represent two different words which happen to have the same spelling, but which are not even etymologically related. For instance, we might find in the midst of an anticlerical poem the line "A dean is deep but rather narrow", and we might find in an ancient geography text the sentence "A dean is deep but rather narrow". It seems a significant point to make that "dean" in the first sentence is not an occurrence of the same word as "dean" in the second sentence, but that "deep" and "narrow" in the first sentence are occurrences of the same words as "deep" and "narrow" in the second sentence, but represent different senses of these words. I think that this distinction though useful in general is not relevant either to the question whether the meaning of "any" differs from context to context or to the question whether the meaning of "or" differs from context to context. Accordingly, I shall make no use of it in the present discussion, and I shall assume that one and the same word can mean one thing in one context and something else in another, and shall ask whether this is true of "or" and "any".

26. By considering the example "If Jemima can lick any dog, then Jemima can lick any dog", Geach tries (a) to preclude the inference that "any" can occur in two different senses which proceeds via the inference that sometimes "any" means the same as "some" and (b) to show that "any" means the same in

both occurrences in this sentence. Geach does not try to prove that "any" does not mean the same as "some" in its first occurrence in this sentence; he merely tries to show that it is fallacious to try to infer this from the evidence of the case. It will be useful to look at Geach's reasons for claiming that this inference is fallacious, for, although I do not think it is helpful to suppose that "any" here means the same as "some", nevertheless if it is fallacious to infer from the available evidence that here "any dog" means "some dog", it must, equally much, be fallacious to infer that here the logic of "any dog" is the logic of a disjunctively distributive list of dogs. It is also of some formal interest to ask what are the limitations of the method by which Geach tries to prove the fallaciousness of this sort of inference. His statement of the fallacy which is embodied in such an inference is as follows:

> We just cannot infer that if two propositions verbally differ precisely in that one contains the expression $\underline{E}_1$ and the other the expression $\underline{E}_2$, then, if the total force of the two propositions is the same, we may cancel out the identical parts and say that $\underline{E}_1$ here means the same as $\underline{E}_2$. I shall call this sort of inference the cancelling-out fallacy... (R&G p. 61)

Geach offers as a simple example of the cancelling-out fallacy, the argument that the predicable "____ killed Socrates" must mean the same as the predicable "_____was killed by Socrates", because "Socrates killed Socrates" means the same as "Socrates was killed by Socrates". This sample argument seems conclusively to preclude the possibility of inference of this sort, for if there is one instance of "p & ∼q", then the falsity of "If p, then q" is guaranteed. Indeed, Geach seems to consider this example to provide an effective demonstration that cancelling out is a fallacious method of arguing, for no other argumentation accompanies his statement of the fallacy. And of course if this sample argument is a genuine instance of the relevant "p & ∼q", then no other argument is necessary; the case is closed.

The statement of the cancelling-out fallacy can be regarded as a statement of a purported fact about a certain set of pairs of sentences, namely the set of pairs of sentences which (a) have the same total force, and (b) verbally differ precisely in that one member of the pair contains one expression, say E_1, and the other member contains a different expression, say E_2. Let us call pairs of sentences of this sort, <u>parallel</u> <u>sentences</u>, and use "E_1" and "E_2" to signify the two expressions which exhaust the verbal differences between such parallel sentences. The form of

Geach's argument can be expressed in the following way: Since there is at least one instance of parallel sentences that is not an instance of synonymy of E_1 and E_2, we cannot infer from the fact that two sentences are parallel that their E_1 and E_2 are synonymous.

27. The force of the claim that cancelling-out is a fallacy is partly derived from the degree of generality of the terms that are used in the definition of cancelling-out. Consider, for example, the term "expression". Parallel sentences have been defined as sentences which are equivalent in force and which verbally differ precisely in that one contains one expression, E_1, and the other contains another expression, E_2. The set of pairs of parallel sentences contains as subsets, the sets of pairs of parallel sentences, the description of which result when, in the definition of parallel sentences, we substitute for the term "expression", other terms of less generality. For instance, one such subset is the set of pairs of parallel sentences which differ verbally precisely in that one contains <u>adverb</u> A_1, and the other contains <u>adverb</u> A_2. Unless in the discovered instance of parallel sentences for which the meaning of E_1 was

different from the meaning of E_2, E_1 and E_2 were adverbial expressions, the discovered instance provides no warrant for claiming that cancelling-out is a fallacy when E_1 and E_2 are adverbial, provided that the form of the argument is: P_1 and P_2 are sentences which are equivalent in force and differ verbally precisely in that one contains adverb A_1 and the other contains adverb A_2; so here A_1 means the same as A_2. It may be that this form of inference is fallacious, but unless, in the discovered instance, E_1 and E_2 are adverbial, one could not establish the fallaciousness of this form of inference on the basis of the discovered instance of "p & $\sim$q" alone. Of course, it may be that in saying that cancelling-out is a fallacious form of inference, Geach is considering arguments in whose verbal expression, for example, the part of speech of E_1 and E_2 is not mentioned, and it may even be that arguments in which terms of less generality than "expression" occur are considered as involving extra premisses, other than those mentioning the equivalence of P_1 and P_2 and stating the precise verbal difference between the two sentences. But if this is the case, then as a philosophic weapon, the cancelling-out fallacy is something less than lethal. For example, it becomes exceedingly difficult to know whom to accuse. For example, if a philosopher claims that since the sentence "Fred is well" has the same total force as the sentence "Fred is in good health", therefore in this instance anyway, "well" means the same as "in good health", we cannot know without asking him whether he has committed the cancelling-out fallacy or not. We cannot know this because we cannot know the degree of generality of the terms that he has used in reaching this conclusion. He certainly need not have used as the major premiss the sentence "All pairs of propositions which have the same total force and which verbally differ precisely in that one contains the expression E_1 and the other contains the expression E_2, expression E_1 means the same as expression E_2". His assumption may have been only that for every such pair of propositions, the expressions which precisely account for their verbal differences are equivalent if they are adjectival. But there need not have been any assumption as general even as this. It may have been only that such adjectival expressions are equivalent for every sentence pair of comparable structural simplicity. We can see, then, that to infer from the fact that the total force of a sentence of the form "If g(any A), then p" is the same as the total force of a sentence of the form "If g(some A), then p", the conclusion that in such instances "any A" means the same as "some A" is not necessarily to commit the cancelling-out fallacy. It is necessary only to write as our conclusion "In such instances, the referring expression "any A" mean the same as the referring expression "some A" ". It seems certain that Geach has supposed the cancelling-out fallacy in the form he has outlined to be capable of work that could be done only by a much strengthened version. For example, he suspects Ockham

> ...of inferring that if in a given case "_f_ (an A)" means much the same as "_f_(some A)", then here "an A" means "some A", and is thus an instance not of confused but of determinate _suppositio_. This, of course, is the cancelling-out fallacy. (_R&G_ p.69)

The foregoing remarks have been limited to arguments using terms of greater grammatical particularity than "expression". But the considerations that have been introduced are absolutely general. No instance of "p & ~q" for which an explanation is possible can establish the fallaciousness of cancelling out for every subset of parallel sentences, just because every explanation will involve citing some feature of P_1 and P_2 or E_1 and E_2 in virtue of which the entailment of the sentence "E_1

means the same as E_2 here" by the sentence "P_1 has the same total force as P_2" fails to hold. So a sample argument for which an explanation is possible would not establish the fallaciousness of cancelling out for the complementary subset of parallel sentences that do not have the feature which provides the basis of this explanation. Indeed, the interesting cases where cancelling-out fails to produce a true conclusion are those cases where an explanation why the conclusion is false can be produced. But if these arguments are invalid, they are invalid for reasons mentioned in the explanations, not just because cancelling-out is in general fallacious. In fact, if cancelling-out is always a fallacy, it is because for every subset of parallel sentences, there is some feature which enables these sentences to have the same total force without the synonymy of E_1 and E_2.

28. Having set out these relevant theoretical considerations, I want to examine more closely the simple example of the cancelling-out fallacy that Geach has offered, and then consider his claim that to say that in the sentence pair "If f(any A), then p"/"If f(some A), then p", "any A" means the same as "some A" is to commit the cancelling-out fallacy.

The first objection to the sample argument is that it does not quite fit the rule. Geach's rule purports to be a rule concerning inferences about the meanings of expressions E_1 and E_2 where two propositions differ verbally precisely in that one contains the expression E_1 and the other contains the expression E_2. But the illustrating argument was an argument about the meaning of the expressions "____killed Socrates" and "____was killed by Socrates", and it is not the case that the sentences "Socrates killed Socrates" and "Socrates was killed by Socrates" differ verbally, precisely because one of them contains the expression "____killed Socrates" and the other contains the expression "____was killed by Socrates". These sentences differ verbally precisely in that one of them contains the words "was" and "by", and the other does not. So if the rule is meant to preclude inferences about the meanings of expressions which exhaust the verbal differences between pairs of parallel sentences, then the rule does not apply in the case of the illustrating argument, because there is no expression that is contained by the first that is not contained by the second. It happens that the second sentence contains two expressions that are not contained by the first, namely, "was" and "by". The force of this criticism depends upon the interpretation of the word "expression", but it can be shown that if these sentences do have E_1 and E_2 expressions and therefore conform to the rule in this respect, some amendment of the statement of the fallacy must be made in order to make these sentences fit the rule in other respects.

If we interpret the term expression in such a way that "was" and "by" do not constitute expressions, and permit only predicables, referring phrases, and adjectival and adverbial expressions to count as expressions then the sentences in the sample argument do seem to have an E_1 and E_2 expression. But they do not yet have an E_1 and E_2 expression in the required sense, since there is no way of regarding the two sentences so that they consist of two expressions which precisely account for the verbal difference between the two sentences plus a verbally identical remainder. That is, regardless of what we regard as an expression, the verbal differences between the two sentences consist precisely in the presence of "was" and "by" in one of them. So if the sample argument is to be an instance of the cancelling-out fallacy, then the statement of the fallacy must be altered in such a way that either it applies also to arguments about the meaning of expressions that account only imprecisely for the verbal difference between the two sentences, or it applies to arguments about the meaning of expressions that account precisely for differences between the sentences that are not merely verbal. The same problem arises with the claim that the argument to the effect that since the sentence "If f(any A), then p" has the same total force as the sentence "If f(some A), then p", here "some A" means the same as "any A" is an instance of the cancelling-out fallacy. For the expressions "any A" and "some A" account for the differences between the two sentences, but not for the verbal differences. These are accounted for by "any" and "some". In order to make the cancelling-out fallacy a fallacy that these inferences could be instances of, the statement of the fallacy must be altered so as to include arguments about the meanings of expressions which contain more than the portions of P_1 and P_2 in virtue of which these sentences verbally differ. What will be important will be that the remainder of P_1 be verbally identical with the remainder of P_2. If committing the cancelling-out fallacy consists in assuming what is an improper analogy between propositional equivalences and mathematical equations then cancelling out should be defined in this way. It is not essential to assume that one can cancel out <u>every</u> identical bit of P_1 and P_2 in order to be assuming this improper mathematical analogy. It is essential only that one assume that one can cancel out <u>any</u> identical bit. Suppose that we amend the statement of the cancelling-out fallacy in such a way that it implies also that this latter assumption is false. This would seem to make the meaning of the expressions "killed Socrates" and "was killed by Socrates" and the expressions "some A" and "any A" at least possible candidates for cases of the cancelling-out fallacy. I think that we shall see that even if there were an analogy between arithmetical and propositional equivalences, this analogy would not permit cancelling out as a form of inference at least in the case of the "Socrates" argument. Let us look at this argument more closely.

The argument goes: The sentence "Socrates killed Socrates" means the same as the sentence "Socrates was killed by Socrates"; therefore, here "killed Socrates" means the same as "was killed by Socrates". Could the invalidity of this argument be used to show the fallaciousness of cancelling out in general? I think that we shall have to say one of two things: (a) if cancelling out is arguing by analogy with a permissible arithmetic inference form, then we shall have to say that it is dubious whether this inference is a case of cancelling out; that is, it is dubious whether the permissibility of arguing by this arithmetic analogy would imply the permissibility of arguing in this way; and in fact if the analogy were thorough-going, it would exclude the possibility of arguing in this way, or (b) if the set of inferences that are to be classed as cancelling-out inferences includes all inferences of this type, whether or not they would be permitted by such an analogy, then we shall have to say that it is doubtful whether the invalidity of the "Socrates" inference could show the fallaciousness of any cancelling-out inferences other than those which misuse the analogy in the way in which this inference does. Consider the first possibility first.

29. If cancelling out is arguing by analogy with the arithmetic inference schema

$$xy = xz \;/\therefore\; y = z$$

then sorts of expressions which we can cancel out in equivalent propositions should be governed by a set of rules analogous to the set of rules governing the sorts of expressions that we can cancel out in equal arithmetical expressions. The arithmetic rules do not permit us to argue from the equivalence

$$1^1 = 1^2$$

to the equivalence

$$1 = 2$$

or from "2 x 2 = 2 + 2" to "x = +". Analogous rules would prohibit certain sorts of cancellations in equivalent sentences. Some such rules would follow from the analogy between multiplication and addition and conjunction and disjunction. We could not, for example, argue from the equivalence of "It is raining and it is raining" and "It is raining or it is raining" to the equivalence here of "and" and "or".

There is one way in which the analogy with arithmetic inference could preclude cancelling out as a permissible method of establishing the identity of any non-propositional E_1 and E_2. One sort of cancellation that is not permitted in arithmetic is one which would produce a combination of characters which did not constitute a well-formed formula, as, for example, an expression consisting two characters separated by "=" where the two characters do not represent the sort of things which the relation represented by "=" can hold. By analogy, one could claim that cancelling out is always a fallacious form of inference unless E_1 and E_2 are propositional expressions and the cancelled-out portions of P_1 and P_2 are also propositions, because the relation holding between P_1 and P_2 could not hold univocally both between propositions and between non-propositional expressions. This explanation would at least have the virtue of being true for every subset of parallel sentences except those which consist of a propositional E_1 or E_2 plus a propositional remainder and therefore true both for the "Socrates" argument and for the argument about the meaning of "any A" and "some A". This wouldbe a plausible argument for the fallaciousness of cancelling-out inferences if, in cancelling out, one were claiming necessarily that since say, the <u>total force</u> of P_1 is the same as the total force of P_2, therefore the total force of E_1 is the same as the total force of E_2. It seems appropriate to speak of the total force of propositions and it seems inappropriate to speak of the total force of non-propositions. It seems at least that "has the same total force as" must mean something different between propositions from what it would mean between non-propositions. If cancelling out is arguing by an arithmetic analogy, the relational expression joining E_1 and E_2 after cancelling out ought to mean the same as the relational expression joining P_1 and P_2 before cancelling out. Otherwise, what we have done is more than merely to have cancelled out. Although this is a plausible move, I do not think that it need be a decisive indication of the fallaciousness of cancelling out as Geach conceives it. Geach speaks of 'the total force' of P_1 and P_2 and of the 'meaning' of E_1 and E_2. One may want to object that the move from a proposition about the total force of P_1 and P_2 to a proposition about the meaning of E_1 and E_2 involves more than a cancelling-out step, but there is no need to expect of these terms such precision that there is no single word that could be substituted for both of them. Geach seems happy to use the single expression "means the same as" between both propositional and non-propositonal expressions, and there seems no reason to suppose that there is no sense of this expression such that it can stand univocally between either propositional or non-propositional expressions.

30. Supposing that there is a sense of "means the same as" or "is equivalent to" in which such a relational expression can stand univocally between either propositional or non-propositional expressions, so that no such consideration as that outlined above need preclude cancelling out as a possible method of

inference; and supposing that cancelling out is conceived of as arguing by an arithmetic analogy, would the permissibility of arguing by this analogy imply the permissibility of inferring from the fact that the sentence "Socrates killed Socrates" means the same as "Socrates was killed by Socrates" the conclusion that here "killed Socrates" means the same as "was killed by Socrates"? It has already been noted that if this inference is to be a possible candidate for being an instance of the cancelling-out fallacy, the statement of the fallacy would have to be altered in such a way that it is immaterial which expressions one wants to claim to be equivalent, provided that these expressions are different, and the sentences are, in other respects, identical. To this amendment, there must be the following exception. This is that in parallel sentences which differ in virtue of two separate pairs of different expressions, for either expression, the sentences will not be identical in other respects. In sentences in which this is the case, it is not to be expected that the expressions which do not correspond would have the same meaning. But the reason why we could not argue from the equivalence of the propositions to the equivalence of these expressions is that these expressions would have been wildly chosen. We could not, for example, argue that because the sentence "Alcibiades was inebriated" means the same as "Drunk was Alcibiades", here "Alcibiades" means "drunk". We would, on the other hand, want to be able to argue that here "drunk" means the same as "inebriated" on the grounds that "Alcibiades was inebriated" means the same as "Drunk was Alcibiades". I think that the reason for the invalidity of the argument from the equivalence of "Socrates killed Socrates" and "Socrates was killed by Socrates" to the equivalence here of "killed Socrates" and "was killed by Socrates" is similar to the reason for the invalidity of the argument from the equivalence of "Alcibiades was inebriated" and "Drunk was Alcibiades" to the equivalence here of "Alcibiades" and "drunk". This can be brought out in the following way. Suppose that we alter the sentence "Socrates killed Socrates" by substituting for the first occurrence of "Socrates", the word "Hemlock". Now, if we are to alter the second sentence in such a way as to produce a sentence which is equivalent to the new sentence "Hemlock killed Socrates", we must change, not the first occurrence of "Socrates", but the second, so that the new sentence produced will be "Socrates was killed by hemlock". This shows that what corresponds to the first occurrence of "Socrates" in the first sentence is, not the first occurrence of "Socrates" in the second sentence, but the second. Similarly, if we substitute for the second occurrence of "Socrates" in the first sentence "the teacher of Plato", then what must be changed in the second sentence in order to make it once more equivalent to this one is, not the second occurrence of "Socrates" but the first. So what corresponds in the second sentence to the second occurrence of "Socrates" in the first sentence, is not the second occurrence of "Socrates" but the first. Now the expression "killed Socrates" is the expression which excludes the first occurrence of "Socrates" in the first sentence. So the expression in the second sentence which corresponds to "killed Socrates" will be the expression which excludes the second occurrence of "Socrates", namely, "Socrates was killed by". It seems just as plausible to claim that "Socrates was killed by" means the same as "killed Socrates" as it is to claim that "Socrates was killed by Socrates" means the same as "Socrates killed Socrates". Similarly, the expression in the second sentence which corresponds to the expression "Socrates killed" in the first, will be the expression which excludes the first occurrence of "Socrates" in the second sentence, namely, the expression "was killed by Socrates". Again, it seems as plausible to claim that "was killed by Socrates" means the same as "Socrates killed" as it is to claim that "Socrates killed Socrates" means the same as "Socrates was killed by Socrates". Furthermore, it seems to be arguable that these sentences are equivalent only insofar as it is arguable that "Socrates killed"" means the same as "was killed by Socrates" and "Socrates was killed by" means the same as "killed Socrates". So although it would be incorrect to argue from the equivalence of "Socrates killed Socrates" to the equivalence of "killed Socrates" and "Was killed by Socrates" or to the equivalence of "Socrates killed" and "Socrates was killed by", it does look as though these sentences could not be equivalent unless "Socrates killed" meant the same thing as "was killed by Socrates". Moreover, in this sort of situation, i.e., where the sentences can be divided into predicable and subject term in more than one way, it seems a highly reasonable way of discovering which way of dividing one sentence corresponds to which way of dividing the other sentence, to discover which pairs of predicables mean the same.

The problems which arise with this sentence pair illustrate the fact that in pairs of parallel sentences, the members of which are divisible in more than one way into E_1 and E_2 and verbally identical remainders, there is no guarantee that every such division will produce an E_1 and E_2 which have the same meaning. But this is not to say that no such division will result in an E_1 and E_2 which are equivalent. The relations between the components of equated mathematical expressions are well-defined relations and cancelling out is accomplished by performing well-defined formally permissible operations on both sides of the equation, not by merely trimming each side by crossing out identical bits, or re-writing the equation with these bits left out. Moving from a propositional equivalence between expressions simply by re-writing the expressions separated by an appropriate equivalence sign without verbally identical bits would not be arguing by mathematical analogy. One would have to recognize that the relations between the components of a sentence of a natural language are, by comparison with those between components of a mathematical expression, immensely complex, and the sort of operations whose permissibility would make cancelling out possible, would be correspondingly complex and diverse. These rules would provide a theoretical basis for the inference that since "Socrates was killed by Socrates" means the same as "Socrates killed Socrates", the expression "was killed by Socrates" means the same as "Socrates killed", but would exclude the inference that in these sentences, "was killed by Socrates" means the same as "killed Socrates". So assuming a thoroughly worked out mathematical analogy, the sample argument would simply not be a properly performed instance of cancelling out, and its invalidity could not establish the fallaciousness of any argument that was an instance of properly performed cancelling out. Moreover, the invalidity of this argument could not establish the invalidity of any inference form other than one which strayed from the procedures that such an analogy would provide in just the way that this argument has.

31. The upshot of all this is that the "Socrates" example will not do the work that Geach seems to think it is capable of performing. What he wants to establish by it is that although we can exploit the synonymy of expressions to construct pairs of equivalent sentences, there are other features of certain sorts of expressions which make it possible to construct pairs of equivalent sentences differing only with regard to these expressions despite the heteronymy of these expressions, and which makes it poss-

ible for us to explain the occurrence of such pairs of sentences without assuming the synonymy of the expressions in virtue of which these sentences verbally differ. The main point of introducing the cancelling-out fallacy when he does, is to strengthen the claim that it is illegitimate to infer from the equivalence of a sentence of the form "If f(any A), then p" and a sentence of the form "If f(some A), then p", the equivalence of "any A" and "some A" in this context. The equivalence of these sentences is, he claims, due to the scope of "any A", not to the synonymy of "any A" and "some A". But it is not necessary for cancelling out always to be fallacious in order for this to be so. To show this, (i.e., that "any" and "some" are not synonymous), one need only show that the scope of "any A" is the whole sentence, while the scope of "some A" is merely the antecedent clause. The fallaciousness of cancelling out is relevant to this enterprise only in that if cancelling out is a fallacy, then this restricts the number of ways open to us of showing what the scope of "any" is. One of the ways by which we cannot show the scope of "any" is by paraphrase, because we cannot assume that the meaning of "any" remains unchanged from the original sentence to the paraphrase. Interestingly, this is the method that Geach uses.

In most cases, the equivalence of sentences is a direct consequence of the synonymy of expressions that they contain. We see this most clearly, when two equivalent sentences have no words in common. In this case, the expressions which account for the verbal differences between the two sentences are the two sentences themselves, and it is permissible to infer from the equivalence of the sentences, the equivalence of the sentences. The smaller the portion of the original sentences which constitute E_1 and E_2, the greater the possibility that these expressions will have some compensatory feature such as scope permitting the equivalence of the sentences despite the heteronymy of E_1 and E_2. But, even so, it is the special case in which such a compensatory feature is operative, and we explain the heteronymy of E_1 and E_2 as well as the equivalence of P_1 and P_2 by saying what this special feature is. Geach's argument is: The "Socrates" argument is an instance in which "p" is true and "q" is false; so it is never correct to infer the truth of "q" from the truth of "p". But it is the truth of some other sentence which permits the truth of "p" despite the falsity of "q". Let us call the set of such sentences the set of R's.

Then if any of $r_1, r_2, r_3, \ldots r_n$ is true, then there is some relevant interpretation of "p" and "q" such that "p & ~q" is possible. So we cannot argue:

$$p \;/\; \text{therefore, } q$$

We must argue:

$$p \;\&\; \sim(r_1 \vee r_2 \vee r_3 \vee \ldots \vee r_n) \;/\; \text{therefore } q$$

But the addition of the negated disjunction of R's amounts only to saying that this is not a special case, and this is usually just assumed. Geach's example can have shown at most that this must not be too readily assumed.

In the above discussion, I have not tried to show that on some occasions "any" means the same as "some"; I have merely tried to show that the considerations that Geach has introduced need not preclude such a conclusion. It need only be shown that the notion of scope is misapplied to "any" in "If f(any A), then p" or that the scope of "any A" is only "f(   )" and this reason for supposing that here "any" does not mean the same as "some" would have disappeared. But even if this reason were to disappear, I do not think that it would be correct to say that in this context, "any" means the same as "some" and in the following section I shall mention some of the considerations that tend to suggest that to say this would be incorrect.

32. It is not a consequence of the fact that an expression of the form "any A" merely be <u>replaceable</u> by a disjunctive list of A's that here "any A" means the same as "some A" even if "some A" is replaceable by a disjunctive list of A's. This is partly because it does not follow from the replaceability of "any A" by a disjunctive list of A's that "any A" is somehow disjunctive in sense. In many cases, there seems as good a case for claiming that "any A" has a long scope as for claiming that "any" has acquired a disjunctive sense. This is the case in negative sentences containing "any" as well as conditional sentences containing "any" in the antecedent clause. In the case of sentences of the form "It is not the case that any A is f" and "If f(any A), then p", there is no means of deciding whether the equivalence with propositional conjunction is due to replaceability of "any A" with a disjunctive list of A's or the replaceability of "any A" with a disjunctive list of A's is due to the equivalence with propositional conjunction. But even in cases where "any A" is replaceable by a disjunctive list and there is no equivalence with propositional conjunction, and where there is, therefore, a case

for saying that "any A" has acquired a disjunctive sense, it need not be the case that "any" means the same as "some". Consider, for example, the case of interrogative sentences. Generally, a sentence of the form "Is any A f?" is equivalent to a sentence of the form "Is it the case that a_1 or a_2 or a_3 or...is f?", and generally, a sentence of the form "Is some A f?" is equivalent to a sentence of the form "Is it the case that a_1 or a_2 or a_3 or...is f?". But examination of some interrogative sentences of this form in use will show that the force of these sentences need not be the same. Each of the interrogative sentences "Did any member vote against the proposal?" and "Did some member vote against the proposal?" is equivalent to an interrogative sentence containing instead of "some member" or "any member", a disjunctive list of members. But there is, nevertheless, a difference between these sentences in some contexts. There is, for example, a difference between them in the context of the following conversation:

A. We had to scrap the proposal.

B. Why? Did some member vote against it?

or

B. Why? Did any member vote against it?

The difference between these two questions, and the reason why the first is more natural here than the second, is that the question "Did some member vote against it?" has relevance to the preceding "Why?", as it were, built in, but the question "Did any member vote against it?" does not. The force of the question "Did some member vote against it?" is to suggest a possible answer to the question "Why?". The force of the two questions occurring in succession is something like the force of the question "Is the reason that someone voted against it?". The reason why interrogative sentences containing "some A" expressions can play this role of complementing previous questions is that "some A" expressions are disjunctive in force in affirmative sentences as well as in interrogative sentences. The reason why this complementing role is precluded for interrogative sentences containing "any A" is that whereas in interrogative sentences, "any" expressions are often disjunctive in force, in corresponding affirmative sentences, "any" expressions would be conjunctive in force. Those interrogative sentences containing "any A" expressions which <u>can</u> play this complementing role are those interrogative sentences in which "any A" expressions are conjunctive in force, as in the interrogative sentence "Can any citizen attend the meeting?" This sentence is equivalent to "Is it the case that any citizen can attend the meeting?" which is equivalent to "Is it the case that c_1 can attend and c_2 can attend and c_3 can attend and...?") The fact that the interrogative sentences containing "any" and "some" differ in force despite the fact that both sentences are equivalent to sentences containing disjunctive lists in the place of "any member" and "some member" show that it is possible to suppose that on occasions "any A" expressions are disjunctive in force without supposing that on these occasions, "any A" means the same as "some A". There is a second point, the relevance of which cannot be fully seen until other matters have been discussed. It is that the explanation of the fact that interrogative sentences containing "some A" expressions can fulfil this complementing function while "any A" interrogatives cannot indicate that the logical role of so-called logical words within sentences is sometimes conditioned by the logical role of these words in other, related sentences. We shall meet this phenomenon later in the context of a more consequential matter where it will be discussed more fully, but it can be noted here that an explanation of this sort accounts for the difference between "any" and "some" in some interrogatives containing certain intensional verbs. The relevant facts are, I think, something like this: To know that some A ϕ's is not necessarily to know of some A that it ϕ's. That is, the sentence "S knows that some A ϕ's" is not equivalent to "There is some A such that S knows that it ϕ's." Secondly, when we describe what we see, hear, feel, smeel, taste, the description that we give is determined in part by what we know to be the case; and when we describe (although, of course, not when we identify) what someone else sees, hears etc., we tailor our description to what we suppose him to know to be the case. So usually, the description that we would give of what someone else sees, is at least roughly the same as the description that he would give himself. For example, even if we know that the A whose ϕ-ing S hears is a_m, if we know that S does not know the identity of the A that he hears ϕ-ing, we do not describe _what S hears_ as a_m ϕ-ing. At most we would say that S hears some A ϕ-ing, but we would say this only if we supposed that S believed it was an A that was ϕ-ing rather than some non-A. So although the sentence "S hears some A ϕ-ing" imples and is implied by the sentence "There is some A such that S hears this A ϕ-ing" the force of these sentences is different because the second suggests that S knows the identity of the ø-er and the first does not. The fact that"some" has this use in these affirmative sentences accounts for the related use that it has in corresponding interrogative sentences, and for the divergence of force of these interrogatives and the same interrogatives containing "any". Consider for example, the difference between the sort of situation in which we might ask a question of the form "Did you hear some A ø-ing" and the sort of situation in which we might ask "Did you hear any A ø-ing". The force of the second of these is something like "Is there some A whom you heard ø-ing?". The force of the first question is more like "Did you hear something which you would describe as some A ø-ing?". Similarly, the question "Did I hear any A ø-ing?" unless I have forgotten and want reminding seems designed to test someone else's knowledge of me, but the force of the question "Did I hear some A ø-ing?" seems to be "Was what I heard some A ø-ing?". The reason why the first question is odd as a request for an identification of what I heard, is that if there had been some A.,say a_m, such that it would have been appropriate to say that I heard a_m ø-ing, then I would have known it, and if my asking the question suggests that I don't know it, then the answer to the question is obviously "No", and I should have known that. So the force of the question "Did I hear any A ϕ-ing?" is such that, unless I have forgotten, I ought to be in a better position than anyone else to answer it. But the force of the question "Did I hear some A ϕ-ing?" is such that I might very well not be in the best position to answer it. This difference would be reflected in the sorts of affirmative answers that we would give to them. We would answer the question "Did I hear any A ϕ-ing?" with "Yes, you heard a_m ϕ-ing. (Don't you remember?)". We would answer the first question with "Yes, it was a_m ϕ-ing. (Couldn't you tell?)".

The fact that in some interrogative sentences, either "any A" or "some A" could be replaced by a disjunctive list of A's despite the heteronymy of "any A" and "some A" in these sentences is related to the fact that propositional disjunctions, in addition to having truth-values, have solutions. A question of the form "p or q?" (or, e.g., "Does a_1 or a_2 ϕ?") can have the force of "Is the sentence 'p or q' true?" and it can have the force of "Which of 'p' and 'q' is true?" We can know the answer to the former question without knowing the answer to the latter question. There seems to be no such clear distinction between interrogatives containing "any" and interrogatives containing "some". That is, it not the case that the force of interrogatives of the form "Does any A ϕ?" is"Which A ϕ's?" while the force of interrogatives of the form "Does some A ϕ?" is "Is it the case that a_1 ϕ's or a_2 ϕ's or a_3 ϕ's or...?". But it does seem to be the case that a question of the form "Does any A ϕ?" while being answerable by "Yes" or "No", does, in the case of an affirmative answer, invite an indication of which A's ϕ, while "Does some A ϕ?" does not, or does so less strongly. So the distinction between solution and truth-value of disjunction directly provides a basis for a weak divergence of function of "any" and "some" in interrogative sentences generally. But in addition, this distinction indirectly provides a basis for such a divergence of sense in interrogative sentences containing intensional expressions. This solution/truth-value distinction may also provide a basis for a difference in function in conditional sentences containing intensional expressions, although the analogy between this case and the case of interrogative sentences is difficult to establish because the rival explanation that the notion of scope provides. That is, we can represent the distinction between the sentence "If you know that some A ϕ's, then p" and "If you know that any A

ϕ's, then p" as the distinction between "If you know that a_1 ϕ's or a_2 ϕ's or a_3 ϕ's or..., then p" and "If (you know that a_1 ϕ's) v (you know that a_2 ϕ's) v (you know that a_3 ϕ's) v..., then p". But the equivalence of the sentence "If you know that any A ϕ's, then p" with this latter sentence is explainable in terms of the equivalence of both these sentences with the conjunctive sentence "(If you know that a_1 ϕ's, then p) & (if you know that a_2 ϕ's, then p) & (if you know that a_3 ϕ's, then p) &...", and the equivalence of this sentence with the original sentence "If you know that any A ϕ's, then p", it can be argued, is due to the scope of "any".

33. The examples that I have offered show that the logical role of "any" need not be identical with that of "some" even though in some contexts both "some A" and "any A" are replaceable with a disjunctive list of A's, and even though the logical role of either of these expressions can be explained in terms of this substitution. The full relevance of this fact to the issues raised by Geach's claim that cancelling out is a fallacy will, it is hoped, become clear later. Its importance for the present discussion is that it provides a possible reason for the joint survival of

a disjunctive "some" and a disjunctive "any", and thus a possible reason for what has hitherto been loosely termed a change of the meaning of "any" between certain sorts of contexts. We must, I think, accept that words sometimes mean one thing in one context and something else in another, and that we can and usually do say what the difference in meaning is between two occurrences of a word by giving possible substitutions for the different occurrences. So the temptation to say that in a certain context one word means the same as another although in other contexts it does not is a temptation to which it is sometimes only rational to succumb. It may be, however, that the temptation is an evil temptation in the case of the so-called topic-neutral expressions "or", "and", "some", "all", "any", etc., and it is with these expressions that we are concerned. Normally, the only means open to us of exhibiting the 'meaning' of these words is that of setting out the equivalences of the sentences containing them. We find normally that for a topic-neutral expression, say tn_1, there is some single propositional form such that any sentence containing tn_1 is equivalent to a sentence of this form, and normally, to point out that such an equivalence holds for any sentence containing tn_1 is as far as we can go toward saying what the 'meaning' of tn_1 is. That is, normally, there is no other topic-neutral expression available which would enable us to construct a sentence of the form "tn_1 means the same as...". There is, however, a temptation to suppose that there is such an expression in a certain set of cases, namely in those cases where sentences of the propositional form by which the 'meaning' of tn_1 is exhibited are sentences which are parallel to the sentence containing tn_1 in the sense of "parallel" defined above (p. 140). In such cases, any sentence containing tn_1 is equivalent to a second sentence which is verbally identical with the former except that it contains, instead of tn_1, some other expression, E_2. Now if the total force of any two such sentences is always the same, then this case begins to resemble the case in which we give the meaning of a word by providing a synonym which is substitutable for it on any occasion, and the temptation to say that tn_1 means the same as E_2 is a difficult temptation to resist. It is doubtful, however, that there are any such cases, The sentences of the propositional form in terms of which the 'meaning' of tn_1 is exhibited need not have the same total force as the corresponding tn_1-containing sentence, they need only have identical truth-conditions, and this is usually the most that we can claim. For instance, Geach has claimed that "*f*(every A)" is true iff "*f*(a_1 and a_2 and a_3 and...)" is true, and if this could be construed as a claim that sentences of these propositional forms would be equivalent in total force, then it would seem to commit us to acceptance of the equivalence of "every A" and "a_1 and a_2 and a_3 and..." because the claim that any sentence of one propositional form is equivalent to the corresponding sentence of the other form is, in this case, just the claim that one expression can be substituted for any occurrence of the other without changing the sense, and this is what constitutes synonymy. But the claim is not that any pair of corresponding sentences of these two forms are equivalent in total force; it is only that the truth-conditions of any such pair of sentences are identical. In fact, two such sentences would not be the same in total force just because "any A" does not mean the same as "a_1 and a_2 and a_3 and...". One can know that a sentence of the form "*f*(every A)" is true without knowing that the corresponding sentence of the form "*f*(a_1 and a_2 and a_3 and...)" is true, since one can know that *f*(every A) without knowing the names of the A's. To suppose that an expression of the form "every A" means the same as the corresponding list of the form "a_1 and a_2 and a_3 and..." would be to suppose that when the membership of the set of A's changes, the meaning of "every A" changes as well, and this is not true. We can, however, reasonably claim the following: First, where sentences of the propositional form in terms of which the 'meaning' of a topic-neutral expression, tn_1 is exhibited are parallel to sentences containing tn_1, the feature of the sentences of this propositional form in virtue of which they are related to the tn_1-containing sentences in the way that they are, is that they contain the particular expression corresponding to tn_1. For example, if we have said anything about the 'meaning' of "every" by saying that every sentence of the form "$\underline{f}$(every A)" has truth-conditions which are identical with those of the corresponding sentence of the form "$\underline{f}$(a_1 and a_2 and a_3 and...)", then this is so because of some relationship between the expression "every A" and the list expression "a_1 and a_2 and a_3 and...". This relation is just that if someone knows that a_1, a_2, a_3,...,a_n exhaust the set of the A's, and if he understands the relevant bits of the English language, then he knows that $\underline{f}$(every A), iff he knows that $\underline{f}$(a_1 and a_2 and a_3 and...a_n). But this relation does not constitute synonymy. Knowing that $\underline{f}$(a_1 and a_2

and a_3 and...a_n) involves knowing more than that <u>f</u>(every A), and knowing for some interpretation of "f" and "A" that "<u>f</u>(every A)" is true iff "f(a_1 and a_2 and a_3 and...a_n)" is true involves knowing more than the meaning of "every A". It involves knowing the names of the A's. Knowing the meaning of "every" consists in knowing that for any instance of an expression of the form "every A" a list of a certain form can be substituted, or rather, it consists in knowing that if, for an expression of the form "every A", a list can be substituted, the list must be of a certain form, namely, of the form "a_1 and a_2 and a_3 and...". It is significant that although the meaning of "every A" can be given in terms of translation into a list of this form, this does not depend upon the distributive properties of this list being constant. In fact it depends upon their not being constant. The explication of "every A" in these terms requires that the distributive properties of "a_1 and a_2 and a_3 and...a_n" be different in the sentences "Tom can lawfully marry a_1 and a_2 and a_3 and...a_n" and "Tom has married a_1 and a_2 and a_3 and ...a_n".

The claim that the logic of "every A" can be understood in terms of translatability into a list of the form "a_1 and a_2 and a_3 and..." is not based upon a cancelling-out inference. It is based on the inter-substitutability of the two expressions in any context in which "every A" occurs. This (a) implies a change, in some contexts, of the distributive properties of the list and (b) does not imply that "every A" can be substituted for any occurrence of the list. The sentences "a_1 and a_2 and a_3 and...a_n sent a donation" need not mean the same as the sentence "Every A sent a donation". But this is equally true of the claim that "f(every A)" is true iff "f(a_1 and a_2 and a_3 and ...)" is true.

34. In the previous sections of this chapter, I have tried (a) to assess the usefulness of the claim that cancelling out is a fallacy for understanding the relation between the disjunctive uses of "any" and the uses of"some", and the relation between these uses of "any" and the conjunctive uses of "any" and (b) to ask whether there is a relation of synonymy between topic-neutral expressions and expressions that are substitutable for them. I shall conclude by briefly saying how this is relevant to the relation between "any" expressions and "or" lists. First, the following are the conditions of intersubstitution. For any context "Λ( )" such that the total force of

"$\wedge$(any A)" is different from the total force of "$\wedge$(every A)", "$\wedge$(any A)" is true iff "$\wedge$(a_1 or a_2 or a_3 or...a_n)" is true. The relation between "any A" and "a_1 or a_2 or a_3 or...a_n" is analogous with the relation between "every A" and "a_1 and a_2 and a_3 and...a_n", in that (a) in order for this substitutability to hold, the distributive properties of the list "a_1 or a_2 or a_3 or...a_n" must be different for different contexts, and (b) it is not the case that "any A" is substitutable for just any occurrence of "a_1 or a_2 or a_3 or...a_n". The difference between the logical role of "any" and the logical role of "every" in contexts in which their logical roles are in fact different ought to be analogous with the difference in logical role in these contexts between "and" and "or" lists.

The various counter-examples that have been offered above show the impossibility of an account of "any" and "or" in terms of translation rules which purport to hold for any sentence containing "any" and any sentence containing an "or" list.

In addition to the difficulties that these counter-examples raise for this sort of account, there are difficulties raised by the adverbial uses of "any". In its adverbial uses, "any" has a decidedly disjunctive flavour. Consider "If his cold is any better, he will be able to attend"; "Is his cold any better?"; "His cold isn't any better". We could of course give a scope translation of the first ofthese, say, "It is true as regards any stage of recovery beyond the stage of recovery that he was at when last I checked, that if he has reached this stage, then he will be able to attend", but whereas this could be a paraphrase of the original, it does not seem to give an indication of the scope of "any" in the original sentence. It seems to show only that the sentence is capable of a paraphrase in which the notion of scope is applicable. The interrogative sentence is not capable of any such paraphrase. In addition, there are few sentences other than conditionals, negative sentences and interrogatives in which "any" has this adverbial use. Sentences of the form "I doubt that..." are exceptions. This fact indicates that, at least in its adverbial uses, "any" has a special role in certain sentences, and these coincide with the sentences in which it is plausible to suggest that an adjectival "any" is disjunctive in import.

What emerges from this is that a proper attitude toward the question of what a word like "any" or "or" 'means' lies somewhere in the following general direction. First, we ought not to look for a single propositional form such that any sentence containing a particular particle would be translatable into a sentence of this form. That is, we should be prepared to admit that such particles sometimes perform different logical tasks in language. Secondly, we ought, as Geach correctly suggests, to resist the temptation to infer that in some contexts, one topic-neutral expression means the same as another, or at least, we ought not to suppose that in saying this, we have given the 'meaning' of either of the expressions. The 'meaning', for example, of "any", insofar as this term applies at all to such an expression, is to be found, not in the contexts in which "every" or "some" could be substituted for it without change of sense, but in those contexts in which it neither means the same as "every" nor means the same as "some". It is the presence in the language of these contexts, and not the presence of the contexts in which intersubstitution between "any" and "every" or "any" and "some" is not logically objectionable, that more likely accounts for the survival of those logical roles of "any" which sometimes coincide with that of "every" and sometimes coincide with that of "some". The question whether the coincidence of logical roles in certain contexts is a relic of an earlier stage in a process of specialization of function, or the product of a process of generalization is a question which a philologist might properly ask, but one which need not concern us here. What is of importance for the proper understanding of these expressions, is just to see that they are not immune from these processes.

CHAPTER FIVE

35. To have given a complete account of the non-propositional uses of "or", one must have given some account of the fact that an "or" list has different distributive properties for different contexts. So far, I have tried to give some account of two of the distributive possibilities of an "or" list. There is, however, a third possibility which has so far remained unmentioned. We have thus far examined those contexts in which an "or" list would normally be interpreted as being disjunctively distributive and those in which such a list would normally be interpreted as being conjunctively distributive. There are in addition to these, contexts in which an "or" list would normally be interpreted as being undistributive. I turn now to a consideration of these. It will be convenient to begin with a possible solution which has been suggested and then rejected by Geach, the solution according to which, in contexts in which an "or" list is undistributive, it is standing in the place of a proper name.

Geach laments the tendency of logicians to treat sentences containing non-propositional expressions compounded by "or" as being merely shorthand for disjunctions of sentences each of which contains one of the members of the non-propositional expression of the original sentence. "We must not take a disjunction of proper names to be obviously less intelligible than a disjunction of propositions or predicables." (R&G p.66). He recognizes that "there are contexts where a disjunction of names cannot very plausibly be reduced to any other sort of disjunction". (p.66) As an example, he offers the sentence "Only Bill or Joe had opportunity to take the ruby" which is not equivalent to "Only Bill had opportunity to take the ruby or only Joe had opportunity to take the ruby". On the basis of this inequivalence, Geach concludes that 'here "Bill or Joe" seems to be genuinely standing in the place of a proper name'. There are two observations that can be made here. The first is that the fact that a sentence containing a list constructed with "or" is not equivalent to a disjunction of sentences does not provide sufficient grounds for inferring that in this sentence the list must be standing in the place of a proper name. For example, there is no need to regard a conjunctively distributive "or" list as standing in the place of a proper name. There is, however, additional warrant for the supposition that in the quoted sentence, "Bill or Joe" is standing in the place of a proper name in the fact that it is neither disjunctively nor conjunctively distributive. The second observation relates to the first. It is that, if a list formed with "or" is undistributive, then, apart from the fact that it is an "or" list rather than an "and" list, there is no obvious reason why this expression should be classified as disjunctive. So, if a list expression must be undistributive in order to be genuinely standing in the place of a proper name, then just those features of the situation will be missing which normally provide a basis for classifying the list expression as disjunctive or conjunctive. So without some additional information as to what constitutes a disjunctive expression, we could not know a disjunctive proper name if we had one. I shall deal with these two points in turn.

First, even if we stipulate that in order for a list expression to be standing in the place of a proper name it must be undistributive, there remains the problem of deciding in particular cases whether a list expression is undistributive. The example which Geach offers shows that the answer to this question is not always obvious. I think that despite the fact that this sentence is not equivalent either to the disjunction or to the conjunction of "Only Bill had opportunity to take the ruby" and "Only Joe had opportunity to take the ruby", nevertheless, the expression "Bill or Joe" is not standing in the place of a genuine proper name in this sentence. If this is so, then either we shall have to say that undistributiveness is not a sufficient condition of nominal status or we shall have to say that the fact that the original sentence is not equivalent either to the conjunction or to the disjunction of these sentences is not a sufficient condition of undistributiveness. I think that an examination of the sentence that Geach quotes will lead us to accept the second alternative, although this is not to say that we shall not eventually have to accept the former as well. The supposition that in the sentence "Only Bill or Joe had opportunity to take the ruby", the list "Bill or Joe" is undistributive involves the assumption that the word "only" is part of the context of the list in the same way that "had opportunity to steal the ruby" is. But the logical role of "only" is not that of qualifying a predicable as in "James is only six years old"; it is that of qualifying a predication. It limits the membership of the set of people who had opportunity to take the ruby to Bill and Joe. Thus it limits to two the number of different sentences of the form "____had opportunity to take the ruby" which can be joined to form a true conjunctive proposition. The two sentences are "Bill had opportunity to take the ruby" and "Joe had opportunity to take the ruby". The question whether the assertion of the original sentence involves the assertion of this conjunctive proposition is a separate question, and the answer that we give to it will depend upon the account that we will want to give of exclusive sentences in general. The present point is just that this sentence can be translated into a sentence which consists in part of the conjunctive sentence "Joe had opportunity to take the ruby and Bill had opportunity to take the ruby", and that therefore, the list "Bill or Joe" is conjunctively distributive, though not, of course, in respect of "Only____had opportunity to take the ruby". Assuming that the role of "only" is to restrict the number of different sentences of the form "____had opportunity to take the ruby" that can be components of a true junctive sentence, we must regard the list "Bill or Joe" as being conjunctively, not disjunctively distributive. This is so for the following reason: whereas one can truly claim that although "p & q" is true, nevertheless, "p & q & r" is false, one cannot, without contradiction, claim that although "p v q" is true, "p v q v r" is false. This does not put the case strongly enough. For even if the force of "only" is such that the original sentence does not imply either the truth or the falsity of the relevant "p" or the relevant "q", this requires that "Bill or Joe" be conjunctively distributive, because although the claim that "p & q & r" is false permits us to be non-commital about the truth or falsity of "p" and "q", the claim that "p v q v r" is false does not. So where "f(a_1 or a_2)" is equivalent to "f(a_1) v f(a_2)", the "only" in "f(only a_1 or a_2)" is redundant, unless "f(only a_1 or a_2)" simply means "f(only a_1) v f(only a_2)".

Apart from these considerations, it is not obvious that "Bill or Joe" is conjunctively distributive in this sentence, but this is because it would not be obvious whether "Bill or Joe" should be understood as being conjunctively or disjunctively distributive in the sentence "Bill or Joe had opportunity to take the ruby". It is clearer that this expression should be conjunctively distributive in the sentence "Only Bill or Joe could have taken the ruby", because it is clearer that "Bill or Joe" should be understood as being conjunctively distributive in the sentence "Bill or Joe could have taken the ruby".

Geach suggests as a possible paraphrase, the sentence "For any x, only if x is Bill or Joe, had x opportunity to take the ruby". In this paraphrase, "Bill or Joe" is disjunctively distributive, the paraphrase being tantamount to "For any x, only if x is Bill or x is Joe, had x opportunity to take the ruby". This is, as Geach notes, 'an artificial-looking form', and it seems implausible that the original sentence has the force it has becuase it is translatable into a sentence of this form. We can, I think, give an account of this paraphrase such that the equivalence holds between these sentences despite the fact that in the original sentence, "Bill or Joe" is a conjunctively distributive list. Normally, we take account of a sentence of the form "p only if q" by translating it into a sentence of the form "If p, then q". Accordingly we would translate "Only if x is Bill or x is Joe had x opportunity to take the ruby" into "If x had opportunity to take the ruby, then x is Bill or x is Joe". The difficulty with translating "p only if q" into "If p, then q" is that the translation retains only minimally the sense of the original. Sometimes the sentence "p only if q" carries with it the suggestion that if q, then p. This suggestion is lost in the translation. In addition, this treatment of the sentence does not really reveal the force of the word "only". One may say, 'the force of the word "only" is to make us turn the sentence about'. But this is not the normal role of "only" in other contexts, and to say that this is its role here seems to be tantamount to claiming that the form "p only if q" is somehow redundant. I think that we shall be able to see more clearly the mechanics of the form "p only if q", by regarding the word "only" as being something like a meta-linguistic device, and the sentence form "p only if q" as a sort of mixed construction. Examples of mixed constructions of similar sorts will serve to illustrate what I mean. Compare the following pairs of sentences

(1) He is coming because he wants to see the 'cello

(2) He is coming because I saw him

(3) You may go to the pictures if you first rake the lawn

(4) You may go to the pictures if you want to

In (1), the 'because' clause gives the reason for his coming. In (2) the 'because' clause gives my reason for saying he is coming. (2) is nonetheless not equivalent to "I say he is coming because I saw him", because (2) implies that he is coming and this sentence does not. In (3), the 'if' clause states the condition under which you have permission to go to the pictures. In (4), the 'if' clause merely gives the condition of my permission's mattering for you. To (3) we could add "If you do not rake the lawn you may not go", but it would be odd to add to (4) "If you do not want to, then you may not go". In (2) and (4), the subordinate clauses are not related to the contents of the main clauses, but to my utterance of the main clauses.

I want to claim that the relation between "only" and "if q, then p" is similar to but not identical with the relation between the subordinate clauses of (2) and (4) to the main clauses of these sentences. It is not identical with the relation between the clauses of (2) and (4), because the subordinate clauses of these sentences are not meta-linguistic. If one were to invent a term to characterize their role, one could say that they are meta-locutive. (2) and (4) are mixed constructions because they contain clauses which modify and condition utterances but have the appearance of clauses modifying and conditioning what is being uttered. The sentence "p only if q" is a mixed construction, I want to say, because it contains a word which characterizes the sentence but which has the appearance of being part of the content of the sentence.

I claimed above that the role of "only" in "Only Bill or Joe had opportunity..." was to limit the sentences of the form "_____had opportunity..." which can be conjoined to produce a true conjunctive sentence to those containing "Bill" and "Joe" as their subject terms. We can give an analogous account of the role of "only" in "p, only if q". We can say that the role of "only" here is to indicate that the only true conditional sentence having "p" as its consequent clause is one which has "q" at least as a conjunct, in its antecedent clause. In sentences of the form "p only if q or r", if the force of "only" is to indicate that the only true conditional sentence having "p" as its consequent clause is one having "q or r" as a conjunct in its antecedent clause, then the force of "only" is to limit the sentences which may be disjoined to "q or r" in the antecedent clause to sentences containing as a conjunct, "q"or "r". Since a conditional sentence of the form "If q or r, then p" is equivalent to a conjunction of "If q, then p" and "If r, then p", the force of "only" in "p only if q or r" is to limit the conditional sentences of the form "If_____, then p" which can be conjoined to produce a true conjunction, to those conditional sentences whose antecedent clauses contain "q" or "r" as a conjunct.

We can represent the sentence "p only if q or r" as being equivalent to "Only $\{$(if q, then p) and (if r, then p)$\}$". Similarly the sentence "For any x, only if x is Bill or x is Joe had x opportunity to take the ruby" can be represented as being equivalent to "Only $\{$(if x is Bill, x had opportunity...) and (if x is Joe, x had opportunity...)$\}$". This does not commit us to the truth of either conjunct. If this is the correct account of the role of "only" in conditional sentences of the form "p only if q", then the equivalence of the sentence "Only Bill or Joe had opportunity ..." to a conditional sentence of this form does not imply that the list "Bill or Joe" is disjunctive. We can explain the equivalence of the original sentence to the conditional sentence by reference to the equivalence of the conditional sentence to a conjunction of conditional sentences guarded by "only".

It will have been noticed that the sense of "distributive" in which "Bill or Joe" is conjunctively distributive in the sentence which we have been examining, is different from the sense given "distributive" in the definitions set out in chapter 1. The distributiveness of "Bill or Joe" is at best a derivative sort of distributiveness, based upon the equivalence of the sentence containing the list to a sentence containing a sentence containing the list, where the list is distributive only in respect of the remainder of the contained sentence. All that need be said at present is that the sense of "distributive" which permits "Bill or Joe" to be distributive here is more useful sense than that which would not. In any case, it can be argued that the sense of "distributive" given at the outset is a special case of this'derived' distributiveness. We could say that the equivalence of a sentence of the form "$\Lambda(a_1$ or a_2 or a_3 or...)" to a sentence of the form "$\Lambda(a_1) \vee \Lambda(a_2) \vee \Lambda(a_3) \vee \ldots$" is the equivalence of a sentence containing a list to a sentence containing a sentence containing a list which is distributive in respect of the contained sentence, but here the contained sentence exhausts the content of the sentence containing it. That is, we could regard the sentence "$\Lambda(a_1$ or a_2 or a_3 or...)" as containing the sentence "$\Lambda(a_1$ or a_2 or a_3 or...)" and nothing else. This will be dealt with more fully in the following chapter. I want to return to the second problem, that of making some sense of the notion of a disjunctive proper name.

36. Geach suggests one way in which we might suppose that we can construe a list formed with "or"

as a genuine complex subject. If "a_1" and "a_2" are the names of two individuals, then we might consider the expression "a_1-or-a_2" as a third proper name which is shared by the two individuals. Thus, we may refer to a_1 either as a_1 or as a_1-or-a_2, and we might refer to a_2 either as a_2 or as a_1-or-a_2. But when we make the statement to the effect that f(a_1-or-a_2), this is ambiguous as being between meaning that f(a_1) and meaning that f(a_2). But the sentence "f(a_1 or a_2)" is not ambiguous in this way. So "a_1 or a_2" cannot be equated with the shared proper name "a_1-or-a_2". He concludes that since there is no other way of construing "a_1 or a_2" as a complex subject other than by equating it with a shared name "a_1-or-a_2", therefore there is no way of construing "a_1 or a_2" as a complex subject. Geach's argument is an interesting one, and, so far as it goes, correct. The force of the argument depends upon the ambiguity of "f(a_1-or-a_2)". One might feel compelled to object, that if he means by saying that "f(a_1-or-a_2)", that it does not tell us which of a_1 and a_2 it is that "f" is true of, then "f(a_1 or a_2)" is ambiguous in precisely the same way. But his point in saying that "f(a_1-or-a_2)" is ambiguous is, I take it, not just that it does not tell us which of "f(a_1)" and "f(a_2)" is true, but that if

"a_1-or-a_2" is a proper name, then the sentence "f(a_1-or-a_2)" purports to tell us who it is that "f" is true of and fails, whereas the sentence "f(a_1 or a_2)" does not even purport to tell us this. We can show that "a_1 or a_2" cannot be equated with "a_1-or-a_2" in another way. The question "Is a_1 or a_2 f?" can have either of two possible senses. In the first sense, it has the force of "Is the sentence "f(a_1 or a_2)" true?" and in this sense, it demands the answer "Yes" or "No". In the second sense, it has the force of "Which of "f(a_1)" and"f(a_2)" is true, and in this sense, it demands the answer "f(a_1)" or "f(a_2)" or "Neither" or "Both". That is, in the former sense, the question asks about the truth of the disjunction "f(a_1) or f(a_2)" and in the second, it asks about the solution of this disjunction. Now if "a_1 or a_2" could be equated with "a_1-or-a_2", then the question "Is a_1 or a_2 f?" could have only the force in which it requires the answer "Yes" or "No". But the question can have either of these two senses, so "a_1 or a_2" cannot be equated with the shared name "a_1-or-a_2". But both these arguments over-simplify the problem in two ways. First, both arguments try to show that "a_1 or a_2" cannot in general be equated with the shared name "a_1-or-a_2". But since there is no one account that we can give of the logical role of "a_1 or a_2" in general, it is hardly to be expected that "a_1 or a_2" could in general be equated with a shared name "a_1-or-a_2". The important question is, not whether "a_1 or a_2" can in general be regarded as standing in the place of a proper name, but whether in those contexts in which it is undistributive, it can be so regarded. Secondly, both arguments assume incorrectly that the only sense that can be made of the notion of a disjunctive proper name is that in which is a shared name. It is certainly true that the shared name "a_1-or-a_2" has a disjunctive look about it, but there is no more basis for saying that "a_1-or-a_2" is a disjunctive proper name than there is for saying that any other shared name is disjunctive; if "a_1-or-a_2" is a disjunctive name, just because both a_1 and a_2 have it, then so is "Rover" whenever there happen to be two dogs about named "Rover".

It is probably because Geach's reason for trying to make sense of the notion of a disjunction of proper names is to lend some plausibility to the notion of confused suppositio that he treats the essential characteristic of a disjunctive proper name as being that it have a peculiar sort of reference. But what sense the notion of a disjunctive proper name would have, it would have because of the sense that attaches to the notion of a propositional disjunction. There are at least two ways in which the notion of a disjunctive proper name could be defined by analogy with propositional disjunction, and what we would expect a disjunctive proper name to be like would depend upon how this analogy were drawn. The analogy underlying Geach's attempt to make sense of this notion seems to me to be the following. The relation between the name and the individual of which it is a name corresponds to the relation between a sentence and the state of affairs in which it is true. A disjunctive proposition "p v q " is in this relation to two states of affairs, the state of affairs in which "p" is true, and the state of affairs in which "q" is true. So a disjunctive proper name is one which is in the corresponding relation to two individuals, and if the names of the individuals are "a_1" and "a_2", then the disjunctive name will be "a_1-or-a_2". But the analogy could also be drawn in the following way; corresponding to the predicable "is true", is the predicable "is the name of a". Since it is the case that if "p" is true, then "p v q " is true, and if "q" is true, then "p v q" is true, therefore, by analogy we will say that if "a_1" is tha name if a, then "a_1-or-a_2"

is the name of a, and if "a_2" is the name of a, then "a_1-or-a_2" is the name of a. Whereas on the previous analogy a disjunctive proper name was one which was shared by two individuals, on this analogy, a disjunctive proper name is one which is constructed out of two proper names which, as it were, share an individual. In some respects this way of drawing the analogy between propositional disjunction and a disjunctive proper name is a better way than that underlying Geach's suggested solution; there are for example, more points of comparison between the sort of disjunctive proper name that it produces and the disjunctive propositional form, than there are between this propositional form and the sort of disjunctive proper name that Geach has contrived. We would, for instance, have a form of disjunctive nominal expression corresponding to the tautologous form "$p \vee \sim p$", namely "Smith or whoever he is". Further, this sort of disjunctive proper name would not produce ambiguous sentences as the shared name does. But if this is the proper way to draw the analogy, then this merely indicates that few expressions of the form "a_1 or a_2" can be regarded as disjunctive proper names. If the central use of the disjunctive propositional form is to assert what is the case in situations in which we do not know which of the disjuncts is true, then the central use of the disjunctive proper name will be to refer to people, in situations in which we do not know which of two names is the correct one to use. But often, the disjoining of a second name is done parenthetically, and what is produced is not a disjunctive proper name, but a disjunction or conjunction of possible utterances, as for example, in the sentence "Cupid, or "Eros" was the God of Love" and "Kelly (or "Cummick" --I can never remember his name) was most helpful".[1] In these sentences, I do not <u>use</u> the names "Eros" and "Cummick", I merely mention names that I could (and in the second sentence, perhaps should) have used. If the way that I have suggested the analogy could be drawn between propositional disjunction and a disjunctive proper name is the way in which this analogy <u>should</u> be drawn, then if there were disjunctive proper names in the language, they would have the same logic as the expressions "Eros or "Cupid"" and "Kelly or"Cummick"". They would not have the same logic as expressions of the form "a_1 or a_2". So although "Eros or "Cupid"" could be regarded as standing in the place

1. Professor Williams has drawn my attention to the following interesting example of this:

   Matutine Pater, seu Iane libentius audis
   (Horace. <u>Satires</u> II, vi)

   "Iane" is in the vocative case and clearly stands in relation to the rest of the sentence in the same way that "Eros" stands in relation to the rest of the sentence quoted above. In the corresponding English sentence "Janus" would be placed in quotes.

of a proper name, "a_1 or a_2" could not. But it is expressions of the form "a_1 or a_2" that we are concerned to understand at present.

37. An account of disjunctive proper names according to which a naturally occurring undistributive "or" list could not be regarded as standing in the place of a proper name seems somehow to be unsatisfactory, because in some respects these expressions are strikingly like proper names. Consider, for example, some of the sentences in which "or" lists are undistributive;

(1) S wants a_1 or a_2 (or a_3 or...)

(2) S ought to (should, must, is ordered to) do a_1 or a_2 (or a_3 or...)

(3) S intends to do a_1 or a_2 (or a_3 or...)

Whereas the central use of the sentence "S has acquired a_1 or a_2" would be to express <u>limited</u> knowledge or at least to give limited information about what S has acquired, the sentence "S wants a_1 or a_2"(if it is true)tells us just as exactly what S wants, (namely, a_1 or a_2) as "S wants a_1" does. To be sure, the sentence "S wants a_1 or a_2" could have the force "S wants a_1 or S wants a_2" but it need not have this force. When "S wants a_1 or a_2" is true, but does not have this force, the inexactitude which is present lies in the want, and not in the telling of it. "a_1 or a_2" seems to name what S wants when S wants a_1 or a_2 as precisely as "a_1" names what S wants when S wants a_1. Again, if we are certain that S wants a_1 or a_2, then we cannot but be certain about what S wants, whereas we can be certain that S has acquired a_1 or a_2 without being certain about what S has acquired. For these reasons it looks as though, in the context "S wants ( )", the expression "a_1 or a_2" does stand in the place of a proper name, and refers unambiguously to what S wants. But "a_1 or a_2" in this context differs from the expression "a_1" in the following crucial respect. Whereas if S wants a_1. there is something of which we can say, "That is what "a_1" refers to; that is what S wants; I'll give it him", if what S wants is a_1 or a_2, there is nothing of which we can say "That is what "a_1 or a_2" refers to; so that is what S wants". But we do reason about people's wants with a view toward acting in accordance with them, or at least taking account of them in our actions, and we do reason in this way about wants that would be expressed in sentences of the form "S wants a_1 or a_2". So either our practical reasoning about people's wants can never be represented as being of the form "S says that he wants a_1. This is what "a_1" refers to. I'll give S this", or our reasoning about wants such as S's want of a_1 or a_2 must take a special form. An examination of the workings of "want" statements in general will, I think, reveal that the form of reasoning appropriate to S's want of a_1 or a_2 is precisely the form that would be appropriate to S's want of a_1. An investigation of the logic of "want" sentences will at the same time shed some light on the relation between practical and theoretical reasoning. It will at once strengthen the claim of A.J.Kenny that in certain respects, the logic of practical reasoning is the mirror image of the logic of theoretical reasoning, and weaken the supposition that there is, as it were, a mirror.

In his paper "Practical Inference" (Analysis 26, (January, 1966)), Kenny quotes the following syllogism from De Motu Animalium (701a18):

> I need a covering
> A cloak is a covering
> I need a cloak
> I must make what I need
> I need a cloak
> I must make a cloak

About this argument Kenny expresses the following misgiving:

> Perhaps the conclusion 'I need a cloak' seems too strong from the premisses 'I need a covering, and a cloak is a covering'; surely I don't

> really <u>need</u> a cloak, a pair of trousers will do as well. We can improve Aristotle's example, for our purposes, by substituting 'want' for 'Need'. 'I want a covering, a cloak is a covering, so I'll make a cloak' would be a perfectly natural piece of practical reasoning. Again a waiter may reasonably say to a dissatisfied customer 'You wanted a steak; this is a steak; this is what you wanted'. (p. 67)

The first point that is relevant to make here is that in the respect in which Aristotle's argument does not come off, the substitution of "want" for "need" makes no difference, and in the respect in which the argument does come off with a substituted "want", it works with "need". The conclusion "I want a cloak" is too strong for the premisses "I want a covering, and a cloak is a covering". On the other hand, the argument "I need a covering, a cloak is a covering, I'll make a cloak" seems unobjectionable. The part of this syllogism which I want to consider is the first: "I need (want) a covering/ A cloak is a covering/ I need (want) a cloak". The relevance of this piece of reasoning is that the facts which provide a basis for assessing this argument provide a basis for understanding the logical role of "or" in "S wants a_1 or a_2".

Kenny claims for this argument that it is an 'appropriate verbalization of reasons of the kind that are operative with us when we make up our minds what to do' (p. 67). And yet, he maintains, 'considered as a theoretical syllogism the argument is certainly invalid, as would be the precisely parallel argument:

I met an animal
An elephant is an animal
I met an elephant (p.66)

Kenny's point in claiming that according to the rules of Aristotle's syllogistic, the "cloak" argument is invalid, is to show that, since the argument is clearly a reasonable one, there must be rules other than those of Aristotle's syllogistic which govern the construction of arguments of this sort. That is, Kenny wants to claim that although this is not a valid theoretical syllogism, it is not an invalid one; it is a valid, non-theoretical syllogism. What sort of non-theoretical argument could this be? One plausible way of regarding this piece of reasoning would be to regard it, other than as an inference of "I want a cloak" from the premisses "I want a covering" and "A cloak is a covering". We might think of it as a case of talking ourselves into wanting a cloak, rather than as an instance of persuading ourselves that we want a cloak. That is to say, we could say that it is a case of coming to have a want rather than a case of coming to know that we have a want. But while this might be the sort of thinking that we would go through and by which we might come to have a new want, this would not make it an argument. Looking at this piece of reasoning in this way, there are two things which we will have to say. First, while this might be a plausible mental exercise in the first person, it would not work in the second or third person. Secondly, since Kenny thinks the waiter's argument is a reasonable one, it is clear that he thinks that this argument could work in the second and third person, so it is not because Kenny sees the "cloak" argument as a process of coming to have a new want that he supposes that it is a valid non-theoretical argument. Kenny seems to regard this piece of reasoning as a piece of practical reasoning, but it is at least not a normal piece of practical reasoning which should culminate in a decision to act. I will try to show that the "cloak" argument is a theoretical argument and is invalid, and that it is invalid for more reasons than those which account for the invalidity of the "elephant" syllogism.

The crux of the difficulty with the "cloak" argument lies in the difficulty in translating the premisses, which Kenny regards as being univocally indefinite, into particular or universal propositions so as to exhibit the form of the syllogism as one assessible by the rules of the syllogistic. Disregarding Aristotle's rule that, for the purposes of constructing syllogisms, indefinite propositions should be translated into particulars, it seems clear enough that the second premiss, "A cloak is a covering" should become "All cloaks are coverings". The problem lies in the first premiss "I want a cloak". Translation of this into a particular proposition produces an invalid argument, and translation into a universal proposition changes the character of the argument. Kenny seems to suppose that this premiss can be translated into a particular proposition without changing the character of the argument, but that the to-be-discovered rules governing practical inferences will permit a syllogism of this form (IAI in first figure) to be valid, provided that it is a practical and not a theoretical syllogism.

Aristotle seems to have supposed that indefinite sentences could be translated into either universal or particular sentences, and were distinguished only in that they contain no mark to indicate which sentence form it is to which they are equivalent. But in sentences of the form "S wants an A", the word "an" does not even provide an indication that the sentence is translatable into one form or the other. Moreover, in "want" sentences, even the presence of the word "any" does not provide such an indication, and this fact is significant. Consider the following dialogue:

A: Which drug do you want?

B: Any drug that will ease the pain.

If we consider that the presence of "any" entitles us to consider B's reply to be elliptical for a statement which is translatable into a universal proposition, then if the set of drugs that will ease the pain is the set of D's, then we will regard B's reply as implying the propositional conjunction "(B wants d_1) & (B wants d_2) & (B wants d_3) &...". But this would be to misrepresent the sense of the sentence "B wants any D". We cannot translate a sentence of the form "S wants X" into a sentence of the form "It is true as regards X that S wants it" except when X is a proper name, or definite description and even then this translatability need not hold. "S wants any A" is not equivalent to "It is true as regards any A that S wants it"; "S wants an A" is not equivalent to "It is true as regards an A that S wants it"; and "S wants a_1 or a_2" is not equivalent to "It is true as regards a_1 or a_2 that S wants it". How then are we to make sense of these three sentences? I think the clue to understanding the role of "any", "an", and "or" in these sentences lies in the following.

38. The central function of expressing our wants is to bring it about that our wants be satisfied; normally the point in issuing an order is to have it obeyed. Normally, we satisfy a person's want by giving him what he says he wants, and obey an order by doing what we are told to do. So a statement of a want could not fulfil its normal function unless it indicated what would satisfy the want. And a command could not function as a command unless it provided an indication of what would count as obeying the command. It follows from this that the normal role of the expression that occurs in the blank space of "S wants ____" is to indicate what will satisfy the want expressed. Thus, if we produce a true sentence by supplying an expression E to "S wants____", then we will produce a true sentence by supplying the expression E to "S has a want which is satisfiable by____" or to "S's want is satisfiable by____". This is true when E is "any A", "an A", or "a_1 or a_2 or...". If S wants a_1 or a_2, then S's want is satisfiable by a_1 or a_2, which is to say, if S wants a_1 or a_2, then S's want is satisfiable by a_1 and S's want is satisfiable by a_2. If S wants a_1 and a_2, then S's want is satisfiable by

a_1 and a_2, and this is not to say that if S wants a_1 and a_2, then S's want is satisfiable by a_1 and S's want is satisfiable by a_2. So what distinguishes the role of "or" in "want" sentences from the role of "and" in these sentences is, not the distributive properties of lists formed with these connectives in the sentence "S wants_____", but the distributive properties of the same lists in "S's want is satisfiable by_____". These remarks have been made with reference to "want" sentences in which the verb "want" has as its direct object, a proper name, a referring phrase, or a list. But precisely the same remarks apply to "want" sentences having as their direct objects, infinitive phrases, and to imperative sentences, except that grammar would require that the corresponding gerundial phrase be supplied to "S's want is satisfiable by_____" and "This order is obeyable by_____" rather than the infinitive phrase of the "want" sentence or the imperative verb form of the command. For example, if S wants to ϕ a_1 or a_2, then S's want is satisfiable by his ϕ-ing a_1 or a_2, i.e., it is satisfiable by his ϕ-ing a_1 and it is satisfiable by his ϕ-ing a_2. Similarly, if I have been ordered to do a_1 or a_2, then I have been given an order which is obeyable by doing a_1 or a_2, i.e., it is obeyable by doing a_1 and it is obeyable by doing a_2. Precisely analogous remarks apply to obligation statements, and to any statements belonging to that area of language in which concepts of the same family as fulfilment, satisfaction, obedience etc. come into use.

The fact that the logic of "want", "must", "ought" statements is not, as it were, self-contained, but is dependent upon the logic of "satisfy", "obey", "fulfil" statements provides an explanation of some of the peculiarities of practical and imperative inference. It explains one of the steps which together enable us to make the move from "S wants an A" and "This is an A" to "I'll give this to S". In addition, it provides an explanation of the inconsistency of the imperatives "Do a_1 or a_2" and "Don't do a_1" which prevents the inference of "Do a_2" from their conjunction.

Of course, the connexion between "want" statements and fulfilment statements does not provide an explanation of the move from a statement about someone's wants to a statement about what I shall do. That is, it does not provide a basis for understanding everything that happens between "S wants an A" and "I'll give S this A", but it does make understandable the move from a statement containing "an A" to the statement about <u>this A</u>. This move is not made on the basis of a translation of the "want" statement into a universal proposition and the application of the rules of the syllogism; nor is it made on the basis of a translation of the "want" statement into a particular proposition and the application of special rules governing practical inference. There is not as the "waiter" and "cloak" examples might lead us to suppose, a move from "S wants an A" to "This is what S wants" at all. The move from the general to the specific is the move from "S wants an A" to "This A will satisfy S's want". The parallel sets of considerations which provide bases for understanding the moves from "I am ordered to ø an A" to "I will ø this A" and from "I ought to do a_1 or a_2" to "I will do a_1" enable us to see what it is that makes the inference from "Do a_1 or a_2 and don't do a_1" to "Do a_2" an impossible inference. I want to consider this sort of inference now.

39. The difficulty in understanding the nature of the incompatibility of the two commands "Do a_1 or a_2" and "Don't do a_1" is partly due to the fact that these expressions are not propositions and are, therefore, neither true nor false. It will simplify matters if we consider the corresponding "want" sen-

tences "S wants a_1 or a_2" and "S does not want a_1", seeing what difficulties the conjunction of imperatives and conjunction of "want" sentences have in common, and what difficulties are left over to be accounted for by the fact that imperative sentences are not propositions and do not have truth-values. The first question we must ask then is: are the sentences "S wants a_1 or a_2" and "S does not want a_1" logically incompatible?

It can be noted first that there is a use of "S wants a_1 or a_2" such that there is no case at all for the claim that the sentences "S wants a_1 or a_2" and "S does not want a_2" are incompatible. This is so because it is possible so to fill in the context of "S wants a_1 or a_2" that it must be taken to be equivalent to "S wants a_1 or S wants a_2". For example, we can say "S wants a_1 or a_2, but I don't know which". In this context "S wants a_1 or a_2" must mean the same as "S wants a_1 or S wants a_2", just because if it did not mean this, the question of which A S wants would not arise. In the sense in which it means "S wants a_1 or S wants a_2", "S wants a_1 or a_2" is not incompatible with "S does not want a_1", and from the conjunction of these, we would normally infer that S wants a_2. Indeed, the addition of "but he does not want a_1" would normally indicate that this was the sense of "S wants a_1 or a_2" that was intended. But the fact that this is so indicates that this addition would be at least odd if "S wants a_1 or a_2" were intended to have the sense in which "a_1 or a_2" is undistributive. What is the character of this oddness?

The sentence

(1) S wants a_1 or a_2

implies the sentence

(2) S has a want which is satisfiable by his having a_1 and S has a want satisfiable by his having a_2.

The sentence

(3) S does not want a_1

is ambiguous as between implying the sentence

(4a) S does not have a want which is satisfiable by his having a_1

and implying the sentence

(4b) S has a want which is satisfiable by his not having a_1

If the force of (3) is such that it implies (4a), then (3) is straightforwardly logically incompatible with (1), because the conjunction of (1) and (3) implies the conjunction of "S has a want which is satisfiable by his having a_1" and the contradictory of this, (4a). If, on the other hand, the sense of (3) is such that

(3) implies (4b), then the problem is that of having two wants, one of which is satisfiable by having a_1 and the other of which is satisfiable by not having a_1. The problem in having these two wants does not consist in the impossibility of satisfying both wants (as would be the case if from "S wants a_1 or a_2" we could infer "S wants a_1"); we can satisfy both wants simply by giving S a_2 and witholding a_1, or taking a_1 from him. One of the reasons why the successive utterance of (1) and (3) is odd is that to utter (1) is to suggest that S's want is satisfiable equally acceptably by his having a_1 and by his having a_2. The utterance of (3) has the effect of denying this. To put it slightly differently, to utter (1) is to suggest that either of two courses of action (namely, giving S a_1 and giving S a_2) could be equally well justified by reference to S's wants. The utterance then of (3) has the effect of making one of these courses of action, (namely giving S a_1) less justifiable by reference to the satisfaction of S's wants than the other. But this sort of oddness is not characteristic of all such conjunctions of "want" sentences, and does not account for all that is the matter with any such conjunction.

40. I have said that to utter "S wants a_1 or a_2"

is to suggest two courses of action either of which is an acceptable means of satisfying S's want, and in the absence of clues to the contrary, we may assume that one course of action is as acceptable a means of satisfying S's want as the other. But in some instances this is not true: specifically, it is not the case for the sentence "S wants a_1 or nothing". The utterance of the sentence does not imply that we can satisfy S's want equally acceptably by giving him a_1 and by giving him nothing at all; nor does this sentence imply that S's want is satisfiable by his having a_1 and is satisfiable by his having nothing at all. One might be tempted, in view of this fact, to suppose that the sentence "S wants a_1 or nothing" means the same as "S wants a_1 or S wants nothing". But the original sentence does not licence us to infer of S that if he does not want a_1 then he wants nothing. It does entitle us to infer of him that if he is not given a_1, then he wants nothing, and this makes this sentence more like "S wants a_1 or a_2" than "S wants a_1 or S wants a_2". Furthermore, to consider the sentence "S wants a_1 or nothing" to be equivalent to "S wants a_1 or S wants nothing" subtly shifts the strength of the sentence. Instead of being a statement about a firm want of S's, it becomes a firm statement about S's want, having a logic somewhat like the sentence "If President DeGaulle relents, I'll eat my hat", which, by inviting the strong denial of "I'll eat my hat", implies the strong affirmation of "President DeGaulle will not relent". But despite the fact that "S wants a_1 or nothing" is of the same form as "S wants a_1 or a_2", it is not the case that it expresses a want which is satisfiable by S's having a_1 and satisfiable by S's having nothing. Compare the conjunctions

(a) S wants a_1 or nothing and he doesn't want nothing

and

(b) S wants a_1 or nothing and he doesn't want a_1.

(a) does not seem in the least odd, but (b) seems odd in the extreme. This is so because the force of "S wants a_1 or nothing" is such that it implies that a_1 will satisfy S's want and nothing else will. But if "S wants a_1 or nothing" were of precisely the same form as "S wants a_1 or a_2", it would imply the sentence "If S is given a_1, then his want will have been satisfied and if S is given nothing, then his want will have been satisfied"; it would not imply the sentence "If S is given a_1 his want will have been satisfied and there is nothing other than a_1 such that if he is given it his want will have been satisfied". I think the clue to understanding this "want" statement lies in recognizing that "nothing" is not a term of the sentence in the same way that "a_1" is. If in "want" sentences, what follows "S wants" is a list of things that will satisfy S's want, in "S wants a_1 or nothing", "nothing" is not a member of this list; its function is to indicate that there are no more members. Its relation to the (one-member) list is like the relation of "only" to the list "Bill or Joe" in "Only Bill or Joe could have taken the ruby". It stands in the place of a second member of the list; it is not itself a member. So even if the sentence "S wants a_1 or nothing" does not imply"S's want is satisfiable by his having a_1 and is satisfiable by his having nothing", it is nevertheless possible to understand this "want" sentence in such a way that it strengthens the claim that I have made that in "want" sentences containing expressions of the form "a_1 or a_2 or..." or "a_1 and a_2 and...", the logic of these expressions is dependent upon their logic in sentences to the effect that that want is satisfiable by a_1 or a_2 or... (or by a_1 and a_2 and...)

A second sort of "want" sentence which seems not to imply a conjunction of "satisfiable" sentences but which seems, superficially at least, to be of the form "S wants a_1 or a_2" is the sentence "S wants liberty or death". This sentence does not seem to imply that S has a want which is satisfiable by his having liberty and is satisfiable by his being killed. Indeed, it seems to imply that S wants liberty, and wants it rather badly. The point of this sort of "want" sentence seems to be something like the following: one envisages three possibilities, that one be alive and free, that one be alive and in some way unfree, and that one be dead. The second of these possibilities is utterly repugnant, and is therefore a possibility that one does not want to realize. But the only alternative to the realization of this possibility is the realization of one of the other two. S's wanting liberty or death is his not wanting enslavement. His want not to be enslaved is satisfaible by his having freedom and is satisfiable by his having death. Part of the force of "S wants liberty or death" is that arranged in order of preference, of these three possibilities, enslavement comes third; it is not part of its force that arranged in order of preference, the other two possibilities share first place. So the sentence "S wants liberty or death" provides a second example of a sentence of the form "S wants a_1 or a_2" for which the conjunction of "S wants a_1 or a_2"

and "S does not want a_1" is not necessarily odd. It seems reasonable for S to want liberty or death and yet not want death, though odd for him to want liberty or death and yet not want liberty. The reason why the former of these is not odd is something like the following: In general, the usefulness of "want" statements is in direct proportion to the precision with which they indicate the courses of action by which the satisfaction of the want can be brought about. So normally, if S wants a_1, or a_2, then S has a want which is satisfiable by a_1 or a_2 and only by a_1 or a_2, and is not satisfiable in any state of affairs which is incompatible with the state of affairs in which S has a_1 or S has a_2. This fact is exploited in a set of "want" sentences of which"S wants liberty or death" is an example. We can give a general account of "want" sentences of this sort which will enable us to predict which sentences of the form "S wants a_1 or a_2" can be conjoined with a sentence of the form "S does not want a_1" or "S does not want a_2" without oddness. These sentences have the following property in common. The state of affairs in which S's want would be satisfied by a_1 is the state of affairs characterized by the truth of "p & q" (because "p" entails "q"). The state of affairs in which S's want would be satisfied by a_2 is the state of affairs in which "$\sim q$" is true, which, since "p" entails "q", is the state of affairs in which "$\sim p$ & $\sim q$" is true. Further, since "p" entails "q", the state of affairs in which "p & $\sim q$" is true is not possible. Thus, only one of the possible states of affairs is excluded, namely that state of affairs in which "$\sim p$ & q" is true. In the case "S wants liberty or death" the state of affairs corresponding to this state of affairs is that in which S is alive but not free. For a large number of wants, an understanding of the states of affairs which are excluded by their satisfaction is central to understanding the wants themselves. This is so, because often the reason why S wants a_1 or a_2 rather than just a_1 or just a_2 is that there is some single state of affairs which is excluded by the satisfaction of the want in either way. It seems clear in the case of S's want of liberty or death that the reason for the want is that satisfaction of it in either of the ways indicated excludes the state of affairs in which S is alive but not free.

41. The mechanics of "or" lists in "want" statements is precisely the same as the mechanics of "or" expressions in imperative sentences. For the most part, it makes no difference whether we say "Do a_1 or

a_2" or "I want you to do a_1 or a_2", or, when merely passing on a command from someone else, whether we say "Do a_1 or a_2" or "S wants you to do a_1 or a_2" or "You are ordered to do a_1 or a_2". Both in the case of "want" sentences and in the case of imperatives, the question as to what makes the sentence true or false need not arise. It seems to arise in the case of "want" sentences only because these seem to say something about S. But in the main, the significance of "want" statements seems to lie, not in whatever information they give us about S, but in the sorts of courses of action which are in accord with them, and to which they give rise. And for the most part, commands give us just as much information about their issuers; they tell us what they want us to do, and that they want us to do it.

Apart from the placation of grammarians, there seems to be no reason why an expression of the form "Do a_1 or do a_2 or do a_3" should be regarded as a disjunctive sentence rather than as a list of actions. The reason usually given for the grammatical classification of commands as sentences is that they are capable of 'standing alone' and are 'complete by themselves'. But if this is the case, then so is "Fred" a sentence, since it is capable of standing alone, as when, for example, we shout his name to attract Fred's attention. Similarly, "Fire" is a sentence, because we can shout "Fire!". A grammarian would, I suppose, reply that these words are indeed capable of being sentences, and they do constitute sentences when they stand alone in discourse. But if the classification is in terms, not of what the expression is capable of doing in discourse, but of what it actually does, then, for example, when we want to attract the attention of Fred and Sandford and shout "Fred and Sandford", it is the whole expression "Fred and Sandford" that counts as a sentence, and this sentence is not a conjunction of sentences, because "Fred" and "Sandford" do not stand alone. So, even if "Do a_1 or do a_2 or do a_3" is a sentence, this does not imply that it is a disjunction of sentences "do a_1", "do a_2","do a_3", and does not preclude its being a list of actions, in addition to being a sentence. All that has been got by this classification is the possibility of a list's being a sentence. But one's reaction to this must be that a classification of an expression as a sentence cannot be based solely upon its actually standing alone in discourse, because if this were the sole basis, then even a declarative sentence of the form "p or q or r" will not be a disjunction of sentences;

indeed there could be no disjunction of sentences that was itself a sentence.

A rationalization that is sometimes given for the classification of imperatives as sentences is that in an expression of the form "do a_1", the subject term, "you" is understood. But there are two things wrong with this. First, when the word "you" precedes the words "do a_1", and the whole expression is a command, it is not a subject term. In the imperative "You,do a_1", the function of "you" is to catch the attention of the recipient of the imperative. Proper names and pronouns occur in the same role in declarative sentences and in interrogatives, as, "Rupert, your tea is ready" and "Roberta, did you touch my papers?". It is precisely in not having an understood subject term that the imperative differs from the indicative sentence which lacks a written or spoken subject term. Consider the difference between "Go home" as an answer to the question "What do I do when I'm finished here?" and "Go home" as a command. It is in the former case that a subject term "you" is understood. In the latter, the "you" is unnecessary because the recipient knows it is he who is being ordered. And if the "you" never actually occurs as the subject term of an imperative, then what this shows is, not that it is always understood, but that it never is.

What is important for understanding the logic of imperatives is not so much to decide whether or not imperatives are sentences-- it seems more useful to say that they are than that they are not--as to discover whether or not the logic of imperatives such as "Do a_1 or do a_2" and "Do a_1 and a_2" can be got at by analogy with disjunctive and conjunctive declarative sentences. My claim is that it is more fruitful to regard imperatives as truncated "want" statements than to regard them as (at least having the same logic as) truncated declarative sentences. Looking at imperatives in this way, we will be less inclined to try to give sense to the notion of imperative inference, and more inclined to discover how conjunctions (sequences) of imperatives actually work. The first thing we will notice is that, faced with, for example, the commands "Do a_1 or do a_2" and "Don't do a_1", the question we must answer is not, "What command can I infer from this conjunction of commands?" but "What does he want me to do?" which is just the question "What must I do to comply with his commands?" The separate question as to whether these commands are in some sense incompatible seems answerable in precisely the same way as the corresponding question about the corresponding "want" sentences. The answer will be that in some instances, this sequence of commands will be odd and in others not. The example offered by Rescher and Robison in "Can One Infer Commands from Commands?" (<u>Analysis</u> 24, (April, 1964)), "John stop that foolishness or leave the room; don't you dare leave this room" (p. 179) in which such a sequence of commands does not seem odd, parallels the sequence of "want" sentences "I want liberty or death; I don't want death". The answer to the question "What does he want?" seems obvious in both cases.

Imperatives present precisely the problems for an account of "or" and "any" that "want" sentences present. The imperative "Choose any A" is not the command to choose a_1 and choose a_2 and choose a_3 and... And the command to choose an A does not seem to be the command that we should choose some particular A, nor, like "Choose any A", that we should choose a_1 and choose a_2 and... The logic of "or", "any" and "an" in imperatives seems to be dependent upon the logical role of these words in the corresponding "obedience" sentences. The distinctions between "or" and "and" and between "any" and "every" in imperatives are likewise dependent upon the corresponding distinctions in the sentences asserting the conditions of obedience of the imperatives.

42. The outcome of this examination of "want", "must", "ought" statements and imperatives is this. To find out what is the logical role of "or" in imperative sentences, what we must do is, not compare imperative sentences of the form "do a_1 or do a_2 or do a_3 or..." with declarative sentences of the form "p or q or r or...", but compare imperative sentences of this form with imperative sentences of the form "do a_1 and do a_2 and do a_3 and..." Similarly, to get at the logical role of "any" in imperatives, we should compare "Do any A" with "Do every A", not with the declarative sentence "f(any A)". That is, once we have seen what counts as obeying a command of the form "Do a_1 or do a_2", then the answer to the question "Why 'or' here?" lies in seeing what counts as obeying a command which differs from this one in that it contains "and" instead of "or". The question "Why is 'or' used here?" must mean "Why is 'or' used here instead of...", and the only reasonable candidate for an alternative is "and". The answer to the question is "Because 'and' has this other use here". The answer to the question "Why is 'or' used here?" will not be "Because 'or' has

this use in other (unrelated) places (say in declarative sentences)'. An important consequence of this is that in the context of imperative sentences, the distinction between conjunction and disjunction cannot be made. We can of course say that in "Do a_1 or a_2", the "or" is disjunctive because we can state the obedience conditions of this as "If you do a_1 or you do a_2, then you will have obeyed this command". And we can say that in "Do a_1 and a_2", "and" is conjunctive, because the conditions of obedience of this command can be stated as "If you do a_1 and you do a_2, then you will have obeyed this command". But there is equal basis for saying that the distinction between them is between distributive and undistributive conjunctions because we can express the difference between their obedience-conditions as the difference between being obeyable by one's doing a_1 or a_2 and being obeyable by doing a_1 and a_2. Furthermore, little will have been achieved by way of a unified account of the logic of "or" and "and" by labelling these uses as disjunctive and conjunctive, because we shall have to formulate rules for operations with disjunctive and conjunctive expressions in this area which are different from the rules for operations with disjunctive and conjunctive declarative sentences. But if these uses of "and" and "or" require rules which are different from the rules governing operations with declarative sentences involving "and" and "or", then this provides grounds for re-classifying these non-declarative uses of "and" and "or" outside the conjunction/disjunction distinction.

In the following chapter I want to examine one method that has been used to apply the conjunction/disjunction distinction in some of the areas in which, in the natural language, "or" lists are conjunctively distributive or undistributive. This is the method by which sentences containing conjunctively distributive "or" lists are formally represented as propositional expressions consisting of an operator adjacent to a disjunctive propositional expression over which it is conjunctively distributive.

CHAPTER SIX

43. In chapter 1 a list was defined as being conjunctively distributive in respect of a context "$\wedge($ $)$" if the sentence consisting of the list occurring in the context "$\wedge($ $)$" was equivalent to the conjunction of sentences each of which consists of a (different) member of the list occurring in the context "$\wedge($ $)$". Similarly, disjunctive distributiveness was defined in terms of the equivalence of the sentence in which the list occurs in the context "$\wedge($ $)$" to the disjunction of sentences in which the members of the list occur in the context "$\wedge($ $)$". Undistributiveness was accordingly defined in terms of the non-implication by sentences containing lists of either conjunctions or disjunctions of sentences of the sorts outlined. But the classification of lists as undistributive solely on the basis of this non-implication is unsatisfactory because it forces us for example to regard the list "a_1 or a_2" as undistributive in the sentence "S knows that a_1 or a_2 is f" even when "f" is interpreted in such a way that "a_1 or a_2 is f" is equivalent to "a_1 is f or a_2 is f". In such a sentence, it seems more natural to say that although the "or" list is undistributive in respect of "S knows that_____is f", it

is disjunctively distributive in respect of "_____is f". Moreover the reason why the list is not distributive in respect of "S knows that_____is f" is that it is not a condition of the truth of "S knows that p or q" that S knows that p or S knows that q. A definition of distributiveness offered in chapter 4 provides a means of accomodating this sort of sentence without requiring an equivalence between "S knows that p or q" and "S knows that p or S knows that q". According to this definition, a list is disjunctively distributive if the sentence containing it is equivalent to a sentence containing a sentence (a propositional expression) containing the list, and the list is disjunctively distributive in respect of the remainder of the contained sentence.

While this definition enables us to classify as distributive, lists which seem intuitively to be distributive, it in many cases, makes it impossible to say whether a list is conjunctively or disjunctively distributive, and if our classification of lists as being disjunctive or conjunctive lists depends upon our classification of them as being disjunctively or conjunctively distributive, then this definition removes our only means of deciding whether a list is disjunctive or conjunctive as well. For example, since the conditional sentence "If f(a_1 or a_2), then p" is equivalent both to "If f(a_1) or f(a_2), then p" and to "(If f(a_1), then p) & (if f(a_2), then p)", there is equal basis for saying that the list "a_1 or a_2" is disjunctively distributive and for saying that it is conjunctively distributive. But the important feature that I want to examine in this chapter is that it provides us with a basis for saying that, despite the fact that "If f(a_1 or a_2), then p" is equivalent to "(If f(a_1), then p) and (if f(a_2), then p)", nevertheless, in this sentence, "a_1 or a_2" is a disjunctive list. For we need only stipulate that if the original sentence containing the list is equivalent to a sentence containing a sentence containing the list, it is the distributive properties of the list within the contained sentence, not its distributive properties in respect of its context as a whole that will provide the procedure for deciding whether the list is disjunctive or conjunctive. Under this stipulation, the list "a_1 or a_2" is disjunctive in "If f(a_1 or a_2), then p", because this sentence is equivalent to "If f(a_1) or f(a_2), then p". Similarly, despite the fact that the English sentence, "If p, then f(a_1 or a_2)" does not imply the disjunction "(If p, then f(a_1)) or (if p, then f(a_2))", nevertheless, we will classify the list "a_1 or a_2" as disjunctive, not as undistributive, because this sentence is equivalent to "If p, then $f(a_1)$ or $f(a_2)$".

44. The possibility that I want to consider is the possibility that every sentence containing an "or" list is equivalent either to a propositional disjunction or to a sentence containing a sentence containing an "or" list which is disjunctively distributive within the contained sentence. If this were the case, there would be no need to postulate that "or" fulfils more than one logical role. The fact that a sentence containing an "or" list was equivalent to a propositional conjunction would always be explicable in terms of the conditions of something-or-other's being true of propositional disjunction, as the equivalence of "If $f(a_1$ or $a_2)$, then p" to "(If $f(a_1)$, then p) and (if $f(a_2)$, then p)" is explicable in terms of the conditions of implication by a disjunction. In addition to providing a basis for a more unified account of the logic of "or", this procedure would enable the development of a deontic logic using propositional variables and would provide a rationale for the use of propositional variables in a calculus of preference.

In the case of the conditional sentence "If f(a_1 or a_2), then p", the move to "If f(a_1) or f(a_2), then p" which forms the basis of the classification of the list "a_1 or a_2" as disjunctive looks like the distribution over the list of part of the context of the list, while the rest of the context, as it were, remains behind. But in general, the procedure involves paraphrase, and the sort of paraphrase that we produce will depend largely upon what we know the final outcome of the sentence to be. Consider for example the sentence "I do not like Hilda or Sarah". Although this is equivalent to "I do not like Hilda and I do not like Sarah", nevertheless we will regard the list "Hilda or Sarah" as disjunctive, because the original sentence is equivalent to "It is not the case that I like Hilda or I like Sarah". We can explain the equivalence of the original sentence to the propositional conjunction in terms of the falsity conditions of propositional disjunction. Giving this account of the sentence "I do not like Hilda or Sarah" involves representing the context "I do not like(   )" as being equivalent to a context consisting of two components, namely the predicable "I like" and the negating prefix "It is not the case that". The sentence "I like Hilda or Sarah" is equivalent to the disjunction "I like Hilda or I like Sarah", and so the list "Hilda or Sarah" is straightforwardly disjunctive. But negating the disjunction that results from distribution of "I like" over the list, results in a propositional conjunction. In this instance, the form that the paraphrase would take was indicated by elements in the original sentence. The negating prefix of the paraphrase corresponds to the negative particle "not" in the original sentence. But it is essential to note that the paraphrase that we give is a result of our understanding the sense of the original sentence; it is not a means to understanding the sense of it. That is, the translation of "I do not like Hilda or Sarah" into "It is not the case that I like Hilda or Sarah" does not take place automatically from our recognition of certain elements in the original sentence. For instance, if we build the negative particle "not" into the verb by writing "dislike" instead of "do not like", we cannot paraphrase the resulting sentence in the same way. The sentence "I dislike Hilda or Sarah" would normally be taken to be equivalent to "I dislike Hilda or I dislike Sarah", not to the corresponding propositional conjunction. Moreover, the fact that these sentences are not equivalent despite the fact that in general "I dislike" means the same as "I do not like" tends to confirm that the reason why the original sentence is capable of paraphrase as I have claimed is that the expression "I do not like" is separable into two different components, that is, that it is not merely a negative predicable, but a predicable together with a negative prefix. This fact is obscured by the fact that the presence of the negative particle "not" alters the verb form.

In general, the paraphrase of a sentence "$\Lambda(a_1$ or $a_2)$" will contain a predicable which when occurring adjacent to "a_1 or a_2" produces a sentence equivalent to the disjunction of the predication of this predicable of a_1 and the predication of this predicable of a_2. In addition, the paraphrase will contain a proposition-forming prefix, that is, a prefix which when attached to a propositional expression produces a new proposition.

Representing the predicable used in such a paraphrase by "f", and the proposition-forming prefix by "Px", it is clear that the possibility of explaining the equivalence of a sentence "$\Lambda(a_1$ or $a_2)$" with a propositional conjunction "$\Lambda(a_1)\ \&\ \Lambda(a_2)$" by reference to the equivalence of "$\Lambda(a_1$ or $a_2)$" with "$Px\{f(a_1$ or $a_2)\}$" which is equivalent to "$Px\{f(a_1) \vee f(a_2)\}$" is dependent upon the availability of a rule in terms of which the distribution of "Px" over propositional disjunction can be explained. When "$\wedge(a_1$ or $a_2)$" is equivalent neither to a propositional conjunction nor to a disjunction, no such rule is required; all that is needed is that we be able to understand what it is for "$Px\{f(a_1) \vee f(a_2)\}$" to be true. Although there may be a formulable rule asserting the truth-conditions of this sentence, the truth-conditions will not be expressible wholly in terms of the truth-conditions of "$Px\{f(a_1)\}$" and "$Px\{f(a_2)\}$". For example, for some interpretations of "f" the sentence "I know that $f(a_1$ or $a_2)$" does not imply "I know that $f(a_1)$ or I know that $f(a_2)$", but we can explain the sense of this sentence by citing its equivalence with "I know that $f(a_1) \vee f(a_2)$". The truth-conditions of "I know that $f(a_1) \vee f(a_2)$" are not stateable terms of the truth-conditions of "I know that $f(a_1)$" and "I know that $f(a_2)$". Nevertheless, the sentence-form "I know that $p \vee q$" has an established use, and sentences of this form have a determinate sense. When "f" is such that "$f(a_1$ or $a_2)$" is equivalent to "$f(a_1) \vee f(a_2)$", the sense of a sentence of the form "I know that $f(a_1$ or $a_2)$" is clearly dependent upon the equivalence of this sentence with "I know that $f(a_1) \vee f(a_2)$".

I want to turn now to a consideration of whether the possibility of paraphrase of the sort outlined above provides a basis for the construction of formal theories of preference, of practical inference, and of deontic modalities, in which junctive propositional expressions replace the lists of the natural language, and the sentences of which are capable of reflecting the logic of preference-statements, "want" statements, and obligation- and permission-statements of the natural language. The possibility of such a paraphrase without logical distortion is assumed in Von Wright's formal theory of preference and in Kenny's theory of practical inference. The importance of the paraphrase procedure for Von Wright's deontic logic is that it provides a possible means of avoiding the equivocation involved in using "v" both as a propositional connective and as a connective between names of acts. Let us first try to determine whether this procedure provides a means of understanding the logical role of "or" in "want" statements.

45. Sentences asserting wants take forms other than that exemplified by the sentence "Mary wants Ted". Infinitives can figure in <u>want</u> sentences as in "Alice wants to see her aunt" or "Alice wants her aunt to come",

and further variations in grammatical form occur according to whether the infinitives are infinitives of transitive or intransitive verbs. But in addition to this, sentences of the same form as "Mary wants Ted" make sense only if an infinitive of which the noun corresponding to "Ted" is the direct object is understood. This is a consequence of a fact that A.J. Kenny has noted (in <u>Action, Emotion and Will</u>)

> For "I want X" to be intelligible at all as the expression of a desire, the speaker must be able to answer the question "what counts as <u>getting</u> X?" (p. 115)

Kenny's condition for the intelligibility of sentences of the form "I want X" can be expressed as the condition that a person who has a want must be able to specify what state of affairs would have to obtain an order for his want to have been satisfied. The want is always expressible, by means of an infinitive phrase, in such a way that it is clear what state of affairs this is. Furthermore any want which can be expressed by means of an infinitive phrase can be expressed by means of a "that" clause. So any sentence of the form "S wants X" is analysable as a sentence of the form "S wants that p". Specifically, when the proper name "a_1" figured in the original sentence as an accusative following the verb "want", the sentence is analysable into some sentence of the form "S wants that $f(a_1)$". So want sentences are capable of paraphrase in the manner outlined earlier. Want statements of the form "S wants a_1 or a_2" can be paraphrased by a sentence of the form "S wants that $f(a_1$ or $a_2)$" which is equivalent to "S wants that $f(a_1) \vee f(a_2)$". Similarly, want statements of the form "S wants an A" can be represented as "S wants that f(an A)" which is equivalent to "S wants that $f(a_1$ or a_2 or a_3 or...)" and therefore to "S wants that $f(a_1) \vee f(a_2) \vee f(a_3) \vee$..." where "$a_1$", "$a_2$", "$a_3$" are regarded as standing in for the proper names of the A's. Want sentences of the form "S wants any A" can be paraphrased in an identical fashion. The possibility of giving this paraphrase of the sentence "S wants a_1 or a_2" seems to show that there is some point in claiming that in this sentence, the list "a_1 or a_2" is a disjunctive list, and that the want expressed by the sentence "S wants a_1 or a_2" is a disjunctive want.

The characterization of the want sentence "S wants a_1 or a_2" as being equivalent to a sentence of the form "S wants that $f(a_1$ or $a_2)$" and thus to a sentence of the form "S wants that $f(a_1) \vee f(a_2)$" is oversimplified in the following way. In general, what we substitute for "ϕ" in the expansion of "S wants a_1"

into "S wants to ϕ a_1" provides a clue to what ought to be substituted for "f" in the translation of "S wants to ϕ a_1" into a sentence of the form "S wants that $f(a_1)$". As Kenny remarks, 'the reason why we usually know offhand how to expand "he wants X" into "he wants to ϕ X" is because given the relevant substitution for "X" we know what to substitute for "ϕ", not because there is some one common ϕ -- say "to have in one's enviroment"-- which can be attached to "wants" in all cases' (AE&W p. 113). But in the case of "S wants that a_1 or a_2", there is no guarantee that the substitution for "a_2". Even if some highly general verb such as "have" could always be substituted for "ϕ", for most pairs of proper names, the resulting "f" would be dubiously univocal in "$f(a_1)$" and "$f(a_2)$". I shall, accordingly, write "S wants p v q" rather than "S wants that $f(a_1)$ v $f(a_2)$". The question that we must ask is then, assuming that any want sentence of the form "S wants a_1 or a_2" must be translatable into a sentence of the form "S wants that p v q" must therefore the logic of the former sort be explained by reference to this translatability? What are the mechanics of the sentence "S wants that p v q"?

If S wants that p v q, then if p v q, then

S's want will be satisfied. So if S wants that p v q, then if p, then S's want will be satisfied and if q, then S's want will be satisfied. This corresponds to Kenny's condition of "I want an X" being a complete specification of one's want, that 'anything which is an X will satisfy the desire'. (AE&W p. 114). We can regard S's want that p v q as the desire for a state of affairs in which "p v q" is true[1]. Any such state will satisfy S's want. Thus, any of: the state in which "p & q" is true, the state in which "p & ~q" is true, the state in which "~p & q" is true, will satisfy S's want. To say that S'a want is satisfiable by any state in which "p v q" is true is to say that his want is satisfiable by any state in which "p" is true and satisfiable by any state in which "q" is true. Furthermore, if the substitu-

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1. To the claim that because every sentence of the form "S wants X" must be understood as being equivalent to a sentence of the form "S wants to ø X" therefore every desire for an object is a desire for a state of affairs, one might want to object as follows. If a statement of the form "S wants X" must be understood as being equivalent to a sentence of the form "S wants to ø X", then the statement "S wants a state of affairs in which "p" is true" must be understood as being equivalent to a statement of the form "S wants to ø a state of affairs in which "p" is true". This objection would not count against this claim, because whereas a want cannot be fully specified without being representable as a desire for a state of affairs, a want is fully specified when the appropriate sentence of the form "S wants a state of affairs in which "p" is true" has been given. When this is the case, there is no "ø", the addtion of which more fully specifies S's want.

tions for "ϕ" provided a complete specification of S's want, then no state in which neither "p" nor "q" is true will satisfy S's want. But a want which is satisfiable by any 'p-state' and any 'q-state' and is not satisfiable by any other state than p-states and q-states is a want which is expressible as: "S wants a p-state or a q-state" which has the form "S wants an A or a B". Furthermore, there seems to be no "ϕ", the addition of which would specify the want more fully. So while in general, a <u>want</u> sentence of the form "S wants X" must be translatable into a sentence of the form "S wants that f(X)", it does not seem that a <u>want</u> sentence of the form "S wants a_1 or a_2" need be translated into a sentence of the form "S wants that p v q" in order for the want it expresses to be fully specified. It is sufficient for this purpose that we be able to replace "a_1" and "a_2" with descriptions of states of affairs. This replacement need not result in a propositional expression. The conclusion is that while wants which are expressible by "S wants a_1 or a_2" are also expressible by some sentence of the form "S wants that p v q", our understanding of the want expressed by "S wants a_1 or a_2" is not dependent upon the translatability of this sentence into "S wants that p v q".

We have seen that although the wants reported in sentences of the form "S wants a_1 or a_2" can be equally well reported in sentences of the form "S wants that p v q", the role of "or" in <u>want</u> sentences of the former sort cannot be explained by reference to this translatability. The reason why the move from "S wants a_1 or a_2" to "S wants p v q" is possible is that desire for objects are desires for states of affairs. But the condition that any sentence asserting of S that he wants an object must be translated into a sentence asserting of S that he wants a state of affairs is satisfied by replacing the list of objects "a_1 or a_2" with a list of states of affairs. Secondly, even if we do translate "S wants a_1 or a_2" into "S wants that p v q", this move is possible only because S's desire that p v q is S's desire for a state of affairs in which "p v q" is true. If the set of states of affairs in which "p v q" is true is the set of B's, then S's desire that p v q is S's desire for b_1 or b_2 or b_3 or...

I have claimed above that despite the equivalence of the conditional sentence "If f(a_1 or a_2), then p" with "(If f(a_1), then p) & (if f(a_2), then p)", it is more natural to claim that since the original sentence is equivalent to "If f(a_1) v f(a_2), then p", the list "a_1 or a_2" is disjunctive, not conjunctive. I want now to ask the question whether the possibility of an analogous paraphrase in the case of permission and preference statements provides a basis for saying that in sentences of the form "S may do a_1 or a_2" and "S prefers a_1 or a_2 to a_3" the list "a_1 or a_2" is disjunctive, not conjunctive. I think that we shall see that the same account must be given of "or" in both cases. I shall illustrate the difficulties in the paraphrase solution by reference to permission sentences first and then show how the same considerations apply in the case of preference sentences.

46. In his essay "Deontic Logic", Von Wright takes an extreme view of the role of "or" in permission statements. In the construction of his theory, he uses the concept of <u>performance-value</u> and the concept of <u>performance-function</u>. These are defined as follows:

> The performance or non-performance of a certain act (by an agent) we shall call performance-values (for that agent). An act will be called a performance-function of certain other acts, if its performance-value for any given agent uniquely depends upon the performance-values of those other acts for the same agent. (<u>LS</u> p.59)

Performance-functional expressions are both constructed from names of 'act-qualifying properties, e.g. theft', and are themselves names. The performance-functional expression that is relevant to the present discussion is "A v B" which is the name of the disjunction of the acts A and B. "A v B" is the name of the act which is performed if and only if it is the case that A is performed or B is performed. It is clear that Von Wright means this sentence to convey more than that A or B is performed iff A is performed or B is performed. "A v B" is not merely a list of acts; it is the name of a disjunction of acts. However, the distinction is never made clear, and Von Wright uses eroneous claims about list-containing permission sentences of the natural language to illustrate his principle of Deontic Distribution. In his logic, the disjunction of two acts is permitted, if and only if at least one of the acts is permitted. He clearly supposes that this reflects what is the case for English permission sentences containing "or" lists. He claims (falsely) that 'speaking loud or smoking is permitted in the reading-room, if and only if speaking loud is permitted or smoking is permitted'. One might be inclined to suppose that it is unnecessary to introduce the cumbersome notion of a disjunction of acts if the facts of the natural language that the laws of the Deontic system are meant to reflect are facts about the behaviour of "or" lists of acts in permission sentences.

One reason for Von Wright's introduction of the notion of a disjunction of acts is doubtless that in obligation sentences, lists of acts are undistributive in English and in this respect are like proper names. In addition, Von Wright wants to claim that the things which are pronounced obligatory, permitted, forbidden etc. are acts. What can be inserted in the space of "O ( )" must therefore be the name of an act. A further reason may be that the notion of a disjunction of acts has been included by analogy with the notion of a conjunction of acts which does seem to be an important ingredient for any deontic system.

Von Wright's Principle of Deontic Distribution does not reflect the normal interpretation of permission sentences of the form "S may do a_1 or a_2" which usually means "S may do a_1 and S may do a_2". If speaking loud or smoking is permitted in the reading-room if and only if speaking loud is permitted or smoking is permitted, then the function of a sign to the effect that speaking loud or smoking is permitted in the reading-room can only be to perplex the users of the reading-room; it could not be to give them permission to do anything. If "S may do a_1 or a_2" means "S may do a_1 or S may do a_2", then it is not a permission sentence. These points have been made earlier. (chapter 2) But in addition to the fact that "S may do a_1 or a_2" is equivalent to "S may do a_1 and S may do a_2", it is also a fact of permission sentences that a sentence of the form "S or T may do a_1" is equivalent to a sentence of the form "S may do a_1 and T may do a_1". This indicates that the proper form of the paraphrase of a permission sentence will be one in which both the grammatical subject and the grammatical object of the original permission sentence will occur in the disjunctive propositional expression with a deontic proposition-forming prefix which will be conjunctively distributive over propositional disjunction. The form of the paraphrase could be "It is permitted that S does a_1 or a_2" which would be equivalent to "It is permitted that S does a_1 or S does a_2" and to "It is permitted that S does a_1 and it is permitted that S does a_2". The structure of the propositional expression in virtue of which it is a disjunctive propositional expression is irrelevant. The result is the same for "S ϕ's a_1 or a_2", "S or T ϕ's a_1", and "S ϕ's or ψ's a_1". We can therefore write "It is permitted that p v q". This is equivalent to "It is permitted that p and it is permitted that q". Writing "Per" for "It is permitted that", we get "Per(p v q)" which is true iff "Per(p) and Per(q)". But how are we to explain the equivalence between the permission of a disjunction and the conjunction of permissions? To say merely that this equivalence is due to the formal properties of "Per" is to give no explanation at all. In the case of the conditional sentence "If $f(a_1$ or $a_2)$, then p", we can explain the equivalence with propositional conjunction in terms of the truth-conditions of propositional disjunction and the transitivity of "if...then". That is, we can argue for each of a_1 and a_2, if $f(a_{1\ (2)})$, then $f(a_1) \vee f(a_2)$; if $f(a_1) \vee f(a_2)$, then p; if $f(a_{1\ (2)})$, then p. But the relation denoted by "if...then" is a relation in which a disjunct stands to the disjunction of which it is a member. "Per" does not represent a relation at all, so <u>a fortiori</u> it does not represent a relation in which "p" or "q" can stand to "p v q", so this method of establishing the conjunctive distribution of "per" over "p v q" is ruled out from the start. Indeed, it is far from clear by what logical means this could be established apart from the equivalence of "S may do a_1 or a_2" to "S may do a_1 and S may do a_2" which the paraphrase "Per (p v q)" was introduced to explain. In the absence of a rule for the distribution of "Per" over "p v q", the paraphrasing of "S may do a_1 or a_2" as "It is permitted that S does a_1 or a_2" does not seem to help at all.

We can regard the paraphrase of the permission sentence as the statement that a certain state of affairs is permitted, namely the state of affairs in which S does a_1 or S does a_2. But even if we read the statement "It is permitted that p v q" as "The state of affairs in which "p v q" is true is permitted" apart from the equivalence of the original sentence with the propositional conjunction "S may do a_1 and S may do a_2", there is no apparent reason why we should regard the sentence "The state of affairs in which "p v q" is true is permitted" as being like "The dog is man's best friend" rather than like "The dog is at the door". Indeed there is no apparent reason why we should regard the paraphrase version of the permission statement as being about <u>the</u> state of affairs in which "p v q" is true rather than as being about <u>a</u> state of affairs in which "p v q " is true. And if we consider it to assert that <u>a</u> state of affairs in which "p v q" is true is permitted, then apart from the original equivalence, there is nothing about the statement to indicate whether it should be treated like "A horse pulled the heavy sledge" or like "A horse is a perissodactyl quadruped". If we regard it as being like the former, it will be equivalent to "It is permitted that p or it is permitted that q". But unless there are grounds for considering it as being like the latter independently of its equivalence with "S may do a_1 or a_2", then the possibility of considering the paraphrase as asserting that a state of affairs is permitted does not provide a basis for explaining the equivalence of "S may do a_1 or a_2" and "S may do a_1 and S may do a_2" by reference to the paraphrase. But although this equivalence cannot be explained by reference to the possibility of giving this paraphrase of "S may do a_1 or a_2", we ought not to suppose that the possibility of giving this paraphrase is totally irrelevant to understanding the role of "or" in permission statements. The supposition that every permission statement must be paraphrasable in this way is consistent at least with one troublesome fact of the case, the fact that a sentence of the form "...may do..." is equivalent to propositional conjunction regardless of whether the "or" list occurs in the subject or in the object space, or indeed in the auxiliary verb space. Regarding permission statements as being equivalent to sentences of the form "It is permissible that p" makes it immaterial where the list occurs, because in the paraphrase both the subject term and the object term (and the auxiliary verb) of the original sentence occur in the contained propositional expression. It is unlikely that this paraphrasability should be essential in some way to permission statements and yet not a clue to the logic of "or" lists in these statements.

47. Preference statements present precisely analogous problems when we attempt to explain the role of "or" lists by reference to the possibility of paraphrasing them using sentences containing propositional expressions. Nevertheless it does seem that preference statements must be paraphrasable by statements asserting preferences between states of affairs. If they were not, they would provide no basis for choices, which must be choices between states of affairs. Every sentence of the form "a_1 is preferred to a_2" must be expandible into a sentence in which "a_1" and "a_2" occur as accusatives in gerundial phrases. My preference of a_1 to a_2 provides a basis for my ϕ-ing a_1 rather than ψ-ing a_2 because my preference of a_1 to a_2 is my preference of ϕ-ing a_1 to ψ-ing a_2. We cannot represent preferences using <u>that</u> clauses alone without considerable awkwardness, but we can paraphrase preference sentences by means of gerundial phrases using that clauses. We can represent the preference of a_1 to a_2 by means of the sentence "Its being the

case that $f(a_1)$ is preferred to its being the case that $g(a_2)$", the contents of "f" and "g" being determined by what we substitute for "ϕ" and "ψ". Von Wright's preference operator "P" is defined as meaning "is preferred to" in the sense in which this is roughly equivalent to "is liked more than". If we introduce the proposition-forming operator "Pref" to stand for "Its being the case that...is preferred to its being the case that...", we can represent the expanded version of "a_1 is preferred to a_2" as "$\{f(a_1)\}$ Pref $\{g(a_2)\}$", i.e. as being of the form "(p) Pref (q)". Similarly, we can represent the sentence "a_1 or a_2 is preferred to a_3" by means of an expression of the form "(p v q) Pref (r)". But there is no feature of the paraphrase apart from its equivalence with the original preference statement to indicate whether it is to be taken as asserting that any instance of its being the case that p v q is preferred to its being the case that r, or merely that some instance of its being the case that p v q is preferred to its being the case that r. Only in the former case would the sentence "(p v q) Pref (r)" be equivalent to "(p) Pref (r) and (q) Pref (r)". In the latter case, the sentence "(p v q) Pref (r)" could at most be equivalent to "(p) Pref (r) or (q) Pref (r)".

If every sentence of the form "$\wedge(a_1$ or $a_2)$" which is equivalent to a propositional conjunction, "$\wedge(a_1)$ & $\wedge(a_2)$" were capable of paraphrase by means of a sentence of the form "$Px\{f(a_1) \vee f(a_2)\}$", then if the only contexts in which "any A" occurs and in which there is equivalence with propositional conjunction are those in which an "or" list would be conjunctively distributive, then there would be grounds for claiming that "any A" is an essentially disjunctive expression. But neither of these conditions holds. Sentences containing conjunctively distributive "or" lists adjacent to comparative adjectival or adverbial expressions are not paraphrasable in this way. And "any" often occurs in contexts in which an "or" list would be only disjunctively distributive.

But although in many instances of conjunctively distributive "or" lists, paraphrase is not possible, and although in some cases where paraphrase is possible, this does not help to explain the distributive properties of the list, nevertheless, as we have seen, it does provide an explanation in some cases. In addition, I think that it figures in the explanation in all cases where it is possible. This will be the subject of the next chapter.

CHAPTER SEVEN

48. The sentences "Per(p v q)" and "(p v q) Pref (r)" differ from the sentences "$\sim$(p v q)" and "(p v q) $\rightarrow$(r)" in that whereas the equivalence of the latter sentences to propositional conjunction can be explained wholly in terms of the truth-conditions of propositional disjunction and the properties of "$\rightarrow$", the equivalence of the former to propositional conjunction cannot be explained in this way. Indeed, apart from the equivalence of the former sentences to sentences of the form "S may do a_1 or a_2" and "a_1 or a_2 is preferred to a_3" respectively, and the equivalence of sentences of these forms to propositional conjunction, it is difficult to see how the equivalence of "Per (p v q)" to "Per(p) & Per(q)" and the equivalence of "(p v q) Pref (r)" to "(p) Pref (r) & (q) Pref (r)" can be explained. But if no explanation apart from that afforded by these equivalences is possible, then the equivalence of sentences of the form "S may do a_1 or a_2" and "a_1 or a_2 is preferred to a_3" to sentences containing disjunctive propositional expressions cannot help to explain the distributive properties of "or" lists in sentences of these forms. Only in certain cases can the equivalence of "or" list-con-

taining sentences to propositional conjunction be explained by reference to the equivalence of the list-containing sentence to a sentence containing a disjunctive propositional expression. The sentences "It is not the case that f(a_1 or a_2)" and "If f(a_1 or a_2), then p" are examples of such cases.

Nevertheless, the translation from "S may do a_1 or a_2" to "Per(p v q)" and from "a_1 or a_2 is preferred to a_3" to "(p v q) Pref (r)" can be made. How is the equivalence between "Per(p v q)" and "Per (p) & Per(q)" and between "(p v q) Pref (r)" and "(p) Pref (r) & (q) Pref (r)" to be understood?

The first thing that can be noted is that if "S may do a_1 or a_2" can be paraphrased as "Per (p v q)", then on the same grounds, "S may do a_1 and a_2" can be paraphrased "Per(p & q)", and if "a_1 or a_2 is preferred to a_3" can be paraphrased as "(p v q) Pref (r)", then the sentence "a_1 and a_2 are preferred to a_3" in the sense in which it means "S prefers a_1 and a_2 to a_3" can be paraphrased as "(p & q) Pref (r)". "Per(p & q)" does not imply "Per (p) & Per(q)", and "(p & q) Pref (r)" does not imply "(p) Pref (r) & (q) Pref (r)". There is then a correlation between disjunctive and conjunctive permission and preference statements analogous to the correlation between preference and permission statements containing "or" lists and those containing "and" lists. Disjunctive preference and permission statements are equivalent to propositional conjunction; conjunctive preference and permission statements are not. Preference and permission statements are then similar in this respect:

"(p v q) Pref (r)" is equivalent to "(p) Pref (r) & (q) Pref (r)"

"(p & q) Pref (r)" does not imply "(p) Pref (r) & (q) Pref (r)"

"Per(p v q)" is equivalent to "Per(p) & Per (q)"

"Per(p & q)" does not imply "Per(p) & Per (q)"

But in this respect, preference and permission statements are similar even to statements containing disjunctive and conjunctive propositional expression in which distribution over the disjunction or conjunction can be explained in terms of the truth-conditions of propositional disjunction and conjunction.

"~(p v q)" is equivalent to "~(p) & ~(q)"

"~(p & q)" is equivalent to "~(p) v ~(q)" (i.e., does not imply "~(p) & ~(q)")

"If (p v q), then r" is equivalent to "If (p), then r & if (q), then r"

"If (p & q), then r" does not imply "If (p), then r & if (q), then r"

Moreover, the correlation that holds between "or" lists and "and" lists seems to hold true of propositional disjunction and propositional conjunction as well. That is, not only is it the case that when propositional disjunction is conjunctively distributive, propositional conjunction is not conjunctively distributive, it is also the case that when propositional disjunction is disjunctively distributive only, propositional conjunction is conjunctively distributive.

"(p v q) & r" is equivalent to "(p & r) v (q & r)"
"(p & q) & r" is equivalent to "(p & r) & (q & r)"
"(p v q) v r" is equivalent to "(p v r) v (q v r)"
"(p & q) v r" is equivalent to "(p v r) & (q v r)"

These pairs of expressions show that there is some continuity in the uses of "or" and "and" between sentences in which they occur in list expressions and sentences in which they occur in contained propositional expressions, inasmuch as the distributional correlation that holds for "or" and "and" lists holds also for disjunctive and conjunctive propositional expressions. There is in fact a further distributional correlation that holds both between "or" and "and" lists and between disjunctive and conjunctive propositional expressions. It is that in contexts in which an "or" list or a disjunctive propositional expression is undistributive, an "and" list or a conjunctive propositional expression is conjunctively distributive. Some examples are:

"S wants a_1 or a_2" does not imply "S wants a_1 or S wants a_2"

"S wants a_1 and a_2" is equivalent to "S wants a_1 and S wants a_2"

"S knows that p v q" does not imply "S knows that p or S knows that q"

"S knows that p & q" is equivalent to "S knows that p and S knows that q"

"If p, then q v r" does not imply "If p, then q or if p, then r"

"If p, then q & r" is equivalent to "If p, then q and if p, then r"

But it is not clear in which direction these correlations point, or indeed whether they provide any hint at all of a possible explanation of the distributive properties of lists and of propositional expressions in sentences where the truth-conditions of propositional disjunction and conjunction do not provide a basis for distribution. It is, however, independently clear that we cannot achieve a unified account of the logic of "or" and "and" in terms of these distributional correlations alone. This is so because our classification of lists and propositional expressions as conjunctively or disjunctively distributive was based upon the production of propositional conjunction or disjunction. So we need an independent notion of conjunction and disjunction in order to classify as conjunctively or disjunctively distributive.

One possible explanation is this: We have an independent notion of propositional conjunction and of propositional disjunction in terms of which distribution is defined and in terms of which, in some contexts, distribution can be explained. The distributional correlation between sentences containing propositional conjunction and sentences containing propositional disjunction is, for a certain set of sentences, a result of the truth-conditions of conjunction and disjunction. There is nevertheless this correlation. In contexts in which an expression constructed with "and" does not permit distribution, an expression constructed with "or" is conjunctively distributive. The fact that we explain the distribution, for example, of "It is not the case that" over "p or q" in terms of the falsity conditions of disjunction does not alter the fact that the use of "or" in "It is not the case that p or q" is a use that produces a propositional conjunction, in a context in which "and" would produce an undistributive expression. The uses of "or" which produce propositional conjunction in contexts in which the production of propositional conjunction is not explainable in terms of truth-conditions of disjunction, but in which "and" would produce an undistributive expression can be regarded as an extension of the truth-functionally justifiable uses. This might be the correct genetic explanation of the non-propositional conjunctive uses of "or", but it would not be a unified account of all the uses of "or" both propositional and non-propositional. In order for the explanation that I have suggested is a plausible explanation of the non-propositional uses of "or" to provide as well an account of the propositional uses, it would have to be shown that the distributive properties of disjunction in various contexts are what they are because the distributive properties of conjunction are what they are in these contexts. It is not sufficient that the distributive properties of disjunction could not be as they are without its also being the case that the truth-conditions of disjunction are what they are. I do not see how such a causal relation between the distributive properties of disjunction and the distributive properties of conjunction could be established. But it is possible that there is some such relation.

49. The distributional correlation between propositional conjunction and propositional disjunction may be relevant to explaining the logic of permission and obligation sentences in two ways, and I shall conclude by saying what these are. The first is simply that if the distributional correlation between conjunctive and disjunctive sentences provides an explanation for the distributional correlation between "and" and "or" lists, then it provides an explanation for the fact that "One may do a_1 or a_2" is equivalent to "One may do a_1 and one may do a_2", since "One may do a_1 and a_2" does not imply "One may do a_1 or one may do a_2". The second way in which the propositional correlation may be relevant to understanding permission and obligation statements has interesting consequences for deontic logic, and cannot be discussed without either resorting to triviality or begging important issues of moral philosophy. Before embarking on this discussion, I must mention one relevant matter. This is that a deontic logic in which obligation and permission are interdefinable cannot incorporate the equivalence of "Per(p v q)" and "Per(p) & Per(q)". Writing "Obl" for "It is obligatory that", we can define "Per(p)"

as being equivalent to "$\sim$Obl($\sim$p)", and we can define "Obl(p)" as being equivalent to "$\sim$Per($\sim$p)". "Per (p v q)" is therefore equivalent to "$\sim$Obl($\sim$p & $\sim$q)" If "Per(p v q)" is equivalent to "Per(p) & Per(q)", then "$\sim$Obl($\sim$p & $\sim$q)" must be equivalent to "$\sim$Obl($\sim$p) & $\sim$Obl($\sim$q)". This is not true of ordinary deontic language. That it is not obligatory to keep ones promises and commit suicide does not entail that it is not obligatory to keep ones promises. It is not, however, necessary to accept an equivalence between "Per(p v q)" and "Per(p) v Per(q)", merely the implication of the latter by the former.

The English sentence represented by "Per (p v q)" would normally be taken to be equivalent to an English sentence representable by "Per(p) & Per (q)", and the English sentence represented by "Obl (p v q)" does not entail a disjunction of obligation statements. One might therefore suppose that the relation between these sentences could be explained somehow by translating an obligation statement containing a disjunctive expression into a conditional sentence having a disjunctive consequent clause and a permission statement containing a disjunctive expression into a conditional sentence having a disjunctive antecedent clause. These translations would have the feature of representing both sorts of deontic sentence by a sentence of a common form, and produce disjunction-containing permission sentences which are equivalent to propositional conjunction and disjunction-containing obligation statements which do not imply propositonal disjunction. But because such a translation of disjunction-containing permission sentences would produce sentences which are equivalent to propositional conjunction, this procedure would preclude interdefinability of obligation and permission for reasons just mentioned. It would, however, provide a means of understanding disjunction-containing obligation sentences in terms of the properties of "if...then" and the truth-conditions of propositional disjunction. Moreover, since we know independently how to define permission in terms of obligation and negation, we should be able to translate permission statements into negations of conditional sentences containing negated consequent clauses. Trivially, we can translate a sentence of the form "It is obligatory that p v q" into a biconditional of the form "One fulfils the obligation that p v q, iff p v q". But this does not provide a means of defining permission in terms of obligation. It merely gives the fulfilment conditions of a particular obligation. But although we have a notion of a particular obligation which we fulfil by performing the obligatory act, we also have a more general notion of obligation, according to which we fulfil our obligation only if we perform <u>every</u> obligatory act. That is, although there is a sense of "obligation" according to which a person has fulfilled his obligation to do a_1 if he does a_1, it would, nevertheless, be inappropriate to say that a person has done what he ought to do, if he has done a_1 which he ought to have done, and he has also done a_2 which he ought not to have done. If it is obligatory that p and obligatory that q, then it is obligatory that p & q, and we do not want to say of someone that he has fulfilled his obligation if p &~q. Using this more general notion of obligation, we cannot represent obligation statements by means of a bi-conditional. Although we fulfil the particular obligation to do a_1 or a_2 if we do a_1 and if we do a_2, we do not thereby fulfil the more general obligation. The sentence "It is obligatory that p v q" is represented by the conditional sentence "If S fulfils his obligation, then p v q". This remains a minimum interpretation. We can obtain stronger interpretations of obligation sentences by substituting other propositions for "S fulfils his obligation". What we substitute will reflect what we suppose to be the end or ends of morality. Writing "_Q_" (suggesting '_quidquid_') for the antecedent clause, we will represent obligation sentences by conditional sentences of the form "If _Q_, then p". Using the equivalence between "Per(p)" and "∼Obl(∼p)", we can represent the sentence "Per(p)"by "∼(If _Q_, then∼p)".

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inconsistent, no one command can be sequentially inconsistent. Hence it makes a good deal of difference whether an imperative utterance is construed as conveying one command, or is construed as conveying more than one: for instance, while Williams'

[D1] do x or do y; do not do x; so, do y

suffers from sequential inconsistency, its seeming twin

[D5] do x or do y, and do not do x; so, do y

seems to me perfectly in order. Surely, if Williams is told 'Take one of these pieces of cake, but don't take the larger', he knows perfectly well what do do.

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PURPLENESS: A REPLY TO MR. ROXBEE COX

By R. E. JENNINGS

POSSESSION by an object of a dispositional property has traditionally been supposed to consist in that object's having a tendency to behave in a certain way (i.e. to do or undergo something of a certain sort) in certain circumstances. Mr. J. W. Roxbee Cox has argued (ANALYSIS 24.5 (April 1964), pp. 161–164) that since the possession by an object of *any* property whatsoever consists in the object's having a tendency to do or undergo something of a certain sort under certain conditions, it follows that there are no properties that are not dispositional.

The view that all properties are at least partly dispositional gains some plausibility when one considers that we often attribute to an object a property which is not normally considered dispositional, as a means of predicting that the object will behave in a certain way. Although I may, for example, say of an object that it is round, in the course of giving a description of it, I may, on occasions where a description is inappropriate, say of the same object, that it is round, as a means of predicting that it will behave in certain ways in relation to other objects. 'It is round' may be given the force 'It won't stop square holes'. But this does not entail that even part of the meaning of 'round' is 'unable to stop square holes', although it may be in virtue of possessing the property *roundness* that the object has the further dispositional property, *inability to stop square holes*. Similarly, Mr. Roxbee Cox's further observation that we might discover that the object possessed the property *roundness* by observing its behaviour in relation to other objects, while it points to an intimate connexion between the property *roundness* and the disposition to behave in a certain characteristic way, fails to establish the identity of *roundness* and this disposition.

The main ground for Mr. Roxbee Cox's contention that all properties are dispositional, is that the situation in virtue of which we ascribe to an object a property such as *purpleness*, is of the same sort as the situation in virtue of which we ascribe to an object a property such as solubility in water.

> In the case of such properties as inflammability and solubility in water, we may learn on the strength of perception that a body has such a property by observing the occurrence of some event or the continuing of some state of affairs, that is a characteristic manifestation of the possession by a thing of that property (p. 163).

The ascription of such a property as purpleness is a special case of the above.

> Here the event that occurs (or the state that continues) is the thing's affecting me in a way characteristic of a thing having that property; and this enables us to say that the thing has this property.

There is one observation that ought to be made at the outset about these two passages. That is, that Mr. Roxbee Cox's account of how we learn that a body has such and such a dispositional (in the traditional, i.e. pre-Roxbee Coxian sense) property, neglects a necessary feature of the event in virtue of which we judge that the body has this property. It is that the event must consist in the body's exhibiting behaviour of some sort. It is possible that Mr. Roxbee Cox has decided against using the term *behaviour*, and not only for prudential reasons, for the sense of *behave* in which objects (rather than people and animals) can be said to behave in a certain way, is an extended sense of *behave*. But except for one instance in which he guards the term *behave* in quotation marks (p. 163), there is no hint in his article that he wishes to reject the notion of an object's behaving. If however, his rejection of the term *behaviour* does follow from a rejection of the notion of the behaviour of an object as that in virtue of which we ascribe to an object a dispositional property, then the class of properties in which he wants to include such properties as purpleness and roundness, is not the class of properties that have traditionally been considered dispositional. The reason for this is that the term *disposition* is a term used primarily of people and animals. To say of someone that he is of such and such a disposition is to say that he has an inclination toward a certain sort of behaviour. The propriety of using the term *disposition* in reference to objects, rather than people, depends upon the propriety of ascribing to objects tendencies to *behave* in certain ways. If such properties as *purpleness* are to be admitted to the class of properties that are dispositional in the pre-Roxbee Coxian sense in which brittleness is a dispositional property, it must be shown that the event that occurs, or the state that continues, in virtue of which we say that the object is purple, consists in the object's behaving in some way.

There is a *prima facie* similarity between: (i) the sentence 'The object shattered in a way characteristic of a thing having the property of *brittleness*', and (ii) the sentence, 'The object affected me in a way characteristic of a thing having the property of *purpleness*'; and this apparent similarity, strengthened by the questionable locution 'affected me in a certain way', may lead one to suppose that the object's affecting me in a certain way constitutes a piece of behaviour, in the way that the object's shattering does. Mr. Cox would, for instance, have us believe that when a brittle object is struck with sufficient force, it exhibits two distinct pieces of behaviour: (a) It shatters; and (b) it affects me in a way characteristic of a thing which is shattering. It is these two pieces of behaviour in virtue of which I say (a) 'The object is brittle' and (b) 'The object shattered'. That is, (A) I say that object O is brittle because it shattered, and (B) I say that object O shattered because it affected me in a certain way. There is a hint of logical dissimilarity in the fact that whereas sentence (A) could form part of a justification for saying that O is brittle, sentence (B) could not form part of a justification for saying that O shattered, though it could form part of a causal explanation of my utterance, 'O shattered'. There is a logical relationship in (A) between the observation that O shattered and the statement that O is brittle. The relationship in (B) is the non-logical relationship between my observing the object shattering, and my uttering the words 'O shattered'. This difference can be seen more readily, if we rid (B) of the unnatural locution, 'affected me in a certain way'. Under one possible interpretation, (B) becomes 'I say that O shattered because it appeared to me to shatter', or 'I say that O shattered because I saw it shatter'. There is no logical relationship between the statement 'O shattered' and my observing O's shattering, though there is a logical relationship between the observation that O shattered, and the statement that O is brittle.

Acceptance of the statement 'O's purpleness consists in its disposition to affect me in a way characteristic of a thing that is purple' does not constitute acceptance of the view that *purpleness* is a dispositional property, unless O's affecting me in a way characteristic of a thing having the property *purpleness* constitutes part of the behaviour of O. Even assuming that it is a part of the behaviour of O, it is not behaviour that can be observed. One cannot see an object looking purple, as one can see an object shattering. Though one can perhaps see an object, one cannot see oneself seeing the object. We do at times say such things as 'I caught myself looking back' or 'I caught myself casting furtive glances in the direction of the lighted window'—but these are not occasions of observing the behaviour of things behind us, or lighted windows, but at best behaviour of our own.

These objections to the expression 'affects me in a certain way' depend for their force upon the supposition that Mr. Roxbee Cox's locution 'the object's affecting me in a way characteristic of a thing having the property *purpleness*' can be translated into such an expression as 'the object's looking purple to me'. A second interpretation of this perplexing circumlocution might translate 'affects me in a certain way' into 'reflects lights of such and such a wavelength, which stimulates photo-receptor cells, which start impulses in nerve fibres, etc.' This we might, if pressed, consent to call behaviour of the object, though this would be to give even to the concept of behaviour in the extended sense an unhealthy excess of flesh. We would then say that this behaviour consisted in the object's affecting me in a way characteristic of a thing having the property *purpleness*. This would, furthermore, be behaviour which we could, with proper instruments, observe. The tendency to behave in this way we would classify as a dispositional property. But though it might be in virtue of its purpleness that an object had this dispositional property, or vice versa, this property would not constitute its *purpleness*.

The conclusion can be summarized thus: Where the statement 'The object affects me in a way characteristic of a thing having the property *purpleness*' means 'The object looks purple to me', or 'I see that the object is purple', it is a statement, not about what the object does, but about what it appears to be. Since to say that an object is purple then is not to say that it is disposed to any sort of behaviour, purpleness cannot be called a dispositional property. On the other hand, where the statement 'The object affects me in a way characteristic of a thing having the property *purpleness*' means 'The object reflects light of such and such a wavelength etc.', though this is at least a statement about something that the object does, and the tendency to do this is a dispositional property, this dispositional property is not the property *purpleness*.

All this is not to say that such properties as purpleness and roundness bear no logical resemblances to properties such as brittleness and inflammability. The mapping out of the relations between them lies outside the scope of this discussion. It is not even to say that the traditional distinction between dispositional and non-dispositional properties is a vital one. It is, however, to say that if the distinction is not a genuine one, or not an important one, this is not for the reasons that Mr. Roxbee Cox suggests.

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Ph.D. 1967

TRUTH VALUE GAPS: A REPLY TO MR. ODEGARD

By FRED SOMMERS

IN "On Closing the Truth Value Gap"[1] Douglas Odegard finds me agreeing with Strawson where I had expressed disagreement. I said[2] that statements like (S) 'the present king of France is wise' and (S′) 'the present king of France isn't wise' are false statements because (there being no PKF) neither 'is wise' nor 'isn't wise' is true of the PKF. The difference between denying a predicate of a subject and negating the statement affirming the predicate of the subject is crucial for this view according to which $\sim S. \sim S'$ is a true statement that does not violate the law of excluded middle. As I use 'denial' it does not make sense to speak of denying a statement unless the statement is a *predication*. Thus all logically compound statements—for example 'water cools and fire burns'—can be negated but they cannot be denied. One predication, P′s, is the denial of another, Ps, if the former predicates 'isn't P' (or 'aren't P') where the latter predicates 'is P' ('are P') of the same subject. Aristotle calls such a pair of statements an affirmation and a denial. In the case of singular predications , Aristotle noted[3] that '$P's \equiv \bar{P}s$' always holds where the term $\bar{P}$, affirmed of s, is the contrary of P. Thus, Socrates isn't wise $\equiv$ Socrates is unwise. Clearly 'is unwise' is not true of the PKF any more than 'is wise' is. My position differs from Russell who also says that $\sim S. \sim S'$ because Russell interprets S and S′ as compound statements both containing a common conjunct to the effect that there is a present king of France. I agree with Strawson that S and S′ are predications that do not assert the existence of anyone.

Now despite the fact that Strawson considers both S and its denial to be neither true nor false, Odegard recognizes that the denial-negation distinction makes for different logical conditions for predicating 'false'. Let p be a predication and let p′ be its denial. These two "senses" of 'false' may be distinguished:

F_1. p is $\text{false}_1 \equiv p'. \sim p$

F_2. p is $\text{false}_2 \equiv \sim p$

Clearly the falsity_1 of p entails its falsity_2 but —as with S above—p may be false_2 without being false_1.

This distinction between the predicative (or 'denial') sense of 'false' and the propositional (or 'negation') sense is exploited by Odegard: Strawson is seen as saying that S is neither true nor false_1—which is what I too claim—while I am saying that S is false_2 which Strawson has

[1] ANALYSIS, October 1964 (Vol. 25, p. 10).
[2] ANALYSIS SUPPLEMENT, January 1964 (Vol. 24, p. 120).
[3] De Interpretatione, 20a, 23–28.

JENNINGS (R.E.)
Ph.D. 1967

Reprinted from Vol. No. [Date]

ANALYSIS

Edited by
PETER WINCH

BASIL BLACKWELL · BROAD STREET · OXFORD

to some divine attribute.[1] This guarantees that He is a being of which one cannot speak and *to* which no one without direct religious experience would be tempted to try.

[1] No hint on God's nature is given by man's imperfection. For man is not privative to the divine perfection. Even a perfect man would have properties (D) as well as features (D-or-$\bar{D}$) and these would not be identical in him. We cannot understand a being all of whose attributes are features. It is like thinking of a material object with the general features of Shape, Colour, Texture and so forth but of no particular shape, colour, texture.

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'OR'

By R. E. Jennings

IN this paper I want to draw attention to a confusion about disjunction, the dispelling of which has consequences affecting the formulation of postulate sets for non-propositional logics. In *The Logic of Preference* (Edinburgh, 1963), G. H. von Wright claims that 'disjunctive preferences are conjunctively distributive' (p. 26). By this he means that if someone claims that he prefers either icecream or pudding to cake, then we can infer that he prefers icecream to cake and that he prefers pudding to cake. Symbolizing the state characterized by the presence of icecream by 'p', the state characterized by the presence of pudding by 'q', the state characterized by the presence of cake by 'r', and the preference relation by 'P', we can, von Wright would claim, express the above-mentioned fact in the formula '$(p \vee q)\ P\ (r) \rightarrow (pPr)\ \&\ (qPr)$'. I want to claim that the preference expressed by 'I prefer either icecream or pudding to cake' is not a disjunctive preference, and that 'is preferred to' is conjunctively distributive over this sort of 'or' because any relational expression is conjunctively distributive over it.

Consider the following sentences which are of apparently identical structure:

(a) 'Mary is heavier than either Jack or Bob.'
(b) 'Mary is related to either Jack or Bob.'

Whereas the former sentence is naturally taken to be equivelant to 'Mary is heavier than Jack and Mary is heavier than Bob', the second is naturally taken to mean only that Mary is related to Jack or Mary is related to Bob. One might want to explain this distribution discrepancy by saying that the distribution rules for 'is heavier than' are different from the distribution rules for 'is related to', that whereas some relational expressions are conjunctively distributive over adjacent disjunctive expressions, other relational expressions are not. Presumably this is the sort of explanation that von Wright would want to give.

But an explanation in terms of distribution rules is unsatisfactory for two reasons. First, we can invent a context in which the distribution rules do not hold. We can say, for example, 'Mary is heavier than either Jack or Bob, but I can't remember which' or 'Mary is related to either Jack or Bob, so it doesn't matter which of them you choose'. That this is possible shows that conjunctive distribution over 'or' is neither an inalienable property of 'is heavier than', nor an unattainable property for 'is related to'. Secondly, if we give this sort of explanation, then we are obliged to say of the person who thinks that 'Either icecream or pudding is preferred to cake' means 'Either icecream is preferred to cake or pudding is preferred to cake', that he misunderstands the relational expression 'is preferred to'. I want to claim that the misunderstanding would be a misunderstanding, not of 'is preferred to' but of 'or'.

In contexts where it is clear that it is Jack and Bob that we are talking about, we can say, instead of sentence (a), 'Mary is heavier than either boy'. We could not substitute for sentence (b), 'Mary is related to either boy'. The expression 'either boy', like the expression 'both boys', is conjunctive; so where 'either Jack or Bob' is translatable into 'either boy', 'either . . . or' is conjunctive and not disjunctive. This indicates that the fact that 'is heavier than' is conjunctively distributive over 'or', although 'is related to' is not, is not just a difference in the distributive properties of these two relational expressions. Rather, the difference in distribution is a consequence of a difference in the meaning of 'or'. It is misleading, therefore, to describe the discrepancy as a difference in rules for distribution over adjacent *disjunctive* expressions. I shall accordingly re-state the discrepancy in this way: whereas for some relational expressions, adjacent 'either . . . or' expressions are usually disjunctive, for other relational expressions, adjacent 'either . . . or' expressions are usually conjunctive.

In its original statement, as a difference in the distributive properties of relational expressions, the distribution discrepancy must remain a curious fact about language. In the re-statement that I have given, we can make some sense of it, for it is not just a curious fact about language that 'either . . . or' expressions are disjunctive for some relational expressions and conjunctive for others. The two expressions 'is heavier than' and 'is related to' differ in their *need* for a conjunctive 'either . . . or', because they differ in the following crucial way. Whereas it is possible for Mary to be heavier than Jack and heavier than Bob without being heavier than both, it is not possible for Mary to be related to Jack and related to Bob without being related to both Jack and Bob. That is, the conjunctive expression 'both Jack and Bob', occurring adjacent to 'is (are) heavier than' can be given a combinative interpretation that it cannot be given when it occurs adjacent to 'is related to'. In fact when a 'both . . . and' expression occurs immediately to the *left* of 'is (are) heavier than', it can be given an *exclusively* combinative interpretation. It is, therefore, highly desirable that there should be a conjunctive expression that explicitly excludes a combinative interpretation. It is a reasonable conclusion that the point of the conjunctive 'either . . . or' expression in 'Mary is heavier than either Jack or Bob' is that it is an expression that does not admit of a combinative interpretation. Since a 'both . . . and' expression cannot have a combinative meaning when it is adjacent to 'is related to', there is no need of an explicitly non-combinative expression; so 'either . . . or' is naturally interpreted disjunctively.

The phrase 'is preferred to' is a relational expression for which adjacent 'both . . . and' expressions can be, and often are exclusively combinative. One can prefer bread and butter to dry rolls without preferring butter to dry rolls. The point of the 'either . . . or' expression in 'Either icecream or pudding is preferred to cake' is that it is conjunctive and explicitly non-combinative.

It may be objected to this view that, if we follow out its consequences, we must put an inconsistent interpretation on '**v**' in the formula '$(p\mathbf{v}q)\rightarrow(r\mathbf{v}s)$', since, from this formula we can derive the formula '$[p\rightarrow(r\mathbf{v}s)]$ & $[q\rightarrow(r\mathbf{v}s)]$', but we cannot derive the formula '$[(p\mathbf{v}q)\rightarrow r]$ & $[(p\mathbf{v}q)\rightarrow s]$'. In view of the difference in distribution here, the objection would run, we must say that whereas '$r\mathbf{v}s$' is a disjunction, '$p\mathbf{v}q$' is really a sort of conjunction. Finally, consistency will demand that we introduce a new symbol to take the place of '**v**', not only here, but wherever anything is conjunctively distributive over it.

The reason why this objection does not count against what I have said about 'or' is important. It is as follows: '**v**' is a propositional connective, and the result of flanking it with propositional expressions is to produce a third propositional expression. The connective 'or' is not a propositional connective, and 'icecream or pudding' is not the name of a disjunctive dessert; neither is 'Jack or Bob' the name of a disjunctive boy. Whereas it makes sense to say of the disjunction of the propositions 'p' and 'q' that it implies the disjunction of the propositions 'r' and 's', it does not make sense to say that Mary is related to the disjunction of Jack and Bob. Therefore, although it makes sense to ask under what conditions the disjunction of the propositions 'p' and 'q' implies the disjunction of the propositions 'r' and 's', it does not make sense to ask under what conditions Mary is related to the disjunction of Jack and Bob. The conditions under which 'p or q' implies 'r or s' are determined by the conditions under which 'p or q' is true, and under which 'r or s' is false. Since the truth of 'p' guarantees the truth of 'p or q', if 'p or q' implies 'x', then 'p' implies 'x' . Similarly, since the falsity of 'r' does not guarantee the falsity of 'r or s', that 'x' implies 'r or s' does not itself imply that 'x' implies 'r'. The point here is that in propositional logic, distribution over '**v**' is determined by the truth and falsity conditions of disjunction. In language, where 'or' often links non-propositions, questions of distribution must often be settled before questions of truth and falsity conditions can arise. For example, the correct manner of distribution of 'is heavier than' over 'or' in 'Mary is heavier than either Jack or Bob' must be settled upon before it can be discovered what is sufficient to make the statement true or false. At this level, what is the correct manner of distribution over 'or' depends upon whether 'or' is conjunctive or disjunctive.

Von Wright is, thus, in the following position. If the formula '(p**v**q) P (r)→(pPr) & (qPr)' is to reflect the fact that the sentence 'Either p or q is preferred to r' means the same as the sentence 'p is preferred to r and q is preferred to r', then there is no question of symbolizing this 'or' by '**v**' if '**v**' also does duty as a propositional connective elsewhere in the calculus. If, on the other hand, '**v**' as it is used in this formula is propositional, then he cannot base the postulate upon the fact that 'Either p or q is preferred to r' is equivalent to 'p is preferred to r and q is preferred to r'.

There is a more general conclusion. Distribution over non-propositional 'or' as in 'either p or q is preferred to r', and, importantly, as in 'you may do A or B' depends upon whether 'or' is conjunctive or disjunctive, and this distribution must be carried out prior to the formulation of postulate sets for formal calculi. Any attempt to reflect this distribution *within* a postulate set must result in a calculus that is equivocal with respect to the meaning of '**v**'.

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Ph.D. 1967

—PREFERENCE AND CHOICE AS LOGICAL CORRELATES

By R. E. Jennings

The concept of preference is one mental concept that we can catch with its behavioural pants down. That is to say, since it is a relational concept, we can say what it is like, formally anyway, without any mention of dispositions to behave in particular ways. If we give a dispositional account of preference, then we can ask whether or not preference is like the behaviour mentioned in the dispositional account. This is a question that cannot be asked in the case of other dispositionally analysable concepts. We cannot ask whether being brittle is like shattering or whether being soluble is like dissolving. In this paper I want to show that one sort of preference is necessarily like choice. That is, I want to show that the fact that a certain set of logical properties are properties of one type of preference can be deduced from the fact that these logical properties are properties of choice. But before embarking on this discussion, I must say just what this type of preference is and how it is distinguishable from another equally central preference type. I shall illustrate this distinction by showing that failure to take it sufficiently into account has led one philosopher to oversimplify the concept of preference.

Professor G. H. Von Wright, in *The Logic of Preference* (Edinburgh, 1963) has attempted to set forth a formal theory of preference based upon five basic principles which he takes to be axiomatic. I shall be concerned with the principle which he calls conjunctive expansion and which he symbolizes

$$(pPq) \leftrightarrow (p \& \sim q)\ P\ (\sim p \& q). \quad \text{(p. 40.)}$$

It is read: '" State p is preferred to state q " is materially equivalent to " State p and not-q is preferred to state not-p and q ".' Von Wright bases this principle upon four observations of which the following is exemplary:

> Assume that p and q both obtain. The subject already 'has' both p and q 'in his world'. That he prefers p to q must then mean that he would rather lose q (and retain p) than lose p (and retain q). He would, in other words, rather see his situation changed from p&q to p&~q than see it changed from p&q to ~p&q. (pp. 24-25)

The first thing that should be noted about this observation is that if it is to be reflected in the conjunctive expansion principle, then we must put an inconsistent interpretation on the operator 'P'. For Von Wright has already indicated the sense in which he is using the word 'prefer'.

> The meaning of my somewhat technical phrase 'intrinsically to prefer' is *roughly* the same as what, in ordinary language, we mean by 'to like better (more)'. An (intrinsic) preference, one could say with the *Oxford Dictionary*, is the 'liking of one thing more than another'. (p. 15)

If it is to reflect the observation quoted, then the principle must be read '" Someone likes state p more than state q " is materially equivalent to " Someone would rather see a change to state p&~q than see a change to state ~p&q "'. Under this inconsistent interpretation of 'P', the principle is factually false. A woman might claim that she would rather see her situation change to one in which she had cottage cheese before her but did not have icecream than see her situation change to one in which she had icecream before her but did not have cottage cheese, and she might explain this by saying that she likes cottage cheese more than icecream. But she might explain it by pointing out that although she likes icecream more than cottage cheese, icecream makes her far and cottage cheese does not. This fact is sufficient to falsify the claim that there is a material equivalence between a person's preferring p to q (in Von Wright's sense) and his favouring a change from his present situation to one in which p&∼q obtains over a change from his present situation to one in which ∼p&q obtains.

But since Von Wright does not want 'P' interpreted inconsistently, the most that the foregoing can have shown is that (*a*) the conjunctive expansion principle cannot reflect these observations, and (*b*) the conjunctive expansion principle cannot be established by these observations since the observations are false. It is a separate question whether, if 'P' is interpreted as 'is liked more than', the conjunctive expansion principle could be established by these observations if the observations were true. To assume that it could would be to assume that whenever a person favours a change from his present situation to one in which p&∼q obtains over a change from his present situation to one in which ∼p&q obtains, then it is true to say of him that he likes the situation in which p&∼q obtains more than the situation in which ∼p&q obtains. This may be seen not to be the case. A man who likes scotch without water more than he likes water without scotch may favour a change from his present situation to one in which he has water without scotch over a change from his present situation to one in which he has scotch without water because he has just been hiking or because he has just been converted. Moreover, the conjunctive expansion principle, under this interpretation of 'P' can be shown to be false on quite separate grounds.

If 'P' is to designate the relation 'is liked more than', then that 'pPq' is true of someone entails that the person has had some relevant experience of p and of q. That is, it is false to say of someone that he likes the taste of oranges more than the taste of tangerines if he has never experienced the taste of oranges or has never experienced the taste of tangerines. Thus to say that 'pPq' materially implies '(p&∼q) P (∼p&q)' is to say that if someone likes state p more than state q, then he has had some experience of the states p&∼q and ∼p&q, and this is patently false. A man may like having a brother more than having a sister though he has never been without either.

The central relation of Von Wright's formal theory of preference is the relation 'is preferred to' in the sense in which it is roughly equivalent to 'is liked more than'. In failing to distinguish this relation from the preference relation expressed in statements to the effect that someone would rather x than y, one might come to suppose that the properties of the first sort of preference are necessarily poperties of the second sort. It is in failing to make this distinction that Von Wright is led to assert conjunctive expansibility of the sort of preference that he intended 'P' to symbolize. For the purposes of the following discussion, I shall call preferences of the sort that Von Wright intended to axiomatize P-preferences, and I shall call the sort of preference expressed in statements of the form 'I would rather x than y' R-preferences. Whereas P-preferences are translatable into likings of some things more than others, R-preferences are not.

I want now to examine the ways in which P-preferences and R-preferences are related to each other and to choice, and to show that conjunctive expansibility is a property of R-preference.

R-preferences and P-preferences differ in two important respects: first in the roles that they can play in explanations, and secondly in the presuppositions involved in attributing to someone a preference of one or the other sort. An examination of the differences in the ways in which we elucidate our R-preferences and P-preferences provides an indication of the way in which their explanatory roles differ. This amounts to an examination of the sorts of reasons that we can give for R-preferences and P-preferences. In the sense in which I am using the word 'reason', one could not both have a reason and not know that one had it. They are not the sort of reasons that psychologists search for. P-preferences and R-preferences are asymmetrically related in this respect, for whereas we can explain our R-preferences by citing our P-preferences, the converse is not the case. I can explain why I would rather have an orange than have a tangerine by citing my liking of oranges more than tangerines, but I could not explain why I like oranges more than tangerines by citing the corresponding R-preference. P-preferences do not provide the only means of explaining R-preferences, but they are always a logically possible explanation.

The second explanational difference between P-preferences and R-preferences is in the degree to which explanation is necessary in order for them to be understood. When the question 'Why?' is asked in respect of a P-preference, one can always appropriately reply 'I just do'. This reply serves to explain the preference as one for which there are no reasons, as a sheer liking of one thing more than another. There are some P-preferences that we expect to be of this sort, and there are some people whom we expect to have more of this sort of P-preference than most. 'I don't know much about art (drama, wine, beer, spices) but I know what I like.' R-preferences are, by contrast, preferences that must be explicable by citing reasons. As a response to the question 'Why would you rather have cinnamon than ginger?', 'I just would' is odd unless it is intended as a refusal to reveal the reasons for the preference, or unless the original assertion 'I would rather have cinnamon than ginger' was intended, not as the statement of a preference, but as the announcement of a choice. But even as a formula for the announcement of a choice, 'I would rather x than y' is geared to choices for which we have reasons, and especially to choices for which our preferences provide reasons. To announce a random choice by saying 'I would rather have this one than that one' is to be misleading.

Finally, whereas that a person has a P-preference, presupposes that he has had some experience of the two things between which he has the preference, a person can have an R-preference between two things, one or neither of which he has experienced. We can say 'I would rather be dead than Red' or 'I would rather go to Hell than go to Heaven', but we cannot truthfully say 'I like being dead more than I like being Red', or 'I like going to Heaven more than I like going to Hell'.

Having set out the relevant differences between P-preferences and R-preferences, I shall turn to a formalization of R-preference. The preference relation involved in statements of the form 'S would rather x than y' will be symbolized by the capital letter 'R'. I shall call an 'atomic R-expression' any expession consisting of the operator 'R' having to its left and to its right, variables or truth-functional combinations of variables. The atomic R-expression 'pRq' is read 'Someone would rather p than q'. Molecular R-expressions, *i.e.* truth-functional compounds of atomic R-expressions, are read in the same way, except that the atomic R-expressions after the first atomic R-expression are read 'he would rather . . . than . . .' where 'he' is an anaphoric substitute for 'someone' and has identical reference. The molecular R-expression 'pRq→pRq is read 'That someone would rather p than q materially implies that he (that person) would rather p than q'. The lower case letters 'p', 'q', 'r', . . . can represent any expressions that can be inserted in the blanks of 'Someone would rather . . . than . . .' in order to make it a well-formed sentence of the English language. As a matter of terminological convenience, I shall regard what are designated by the English expressions represented by 'p', 'q', 'r', etc., as generic courses of action. As a means to brevity, I shall regard the status of the variables as representing English expressions designating states of affairs on the one hand, and courses of action on the other, as being determined by the operator. Thus 'pPq' symbolizes the P-preference between state of affairs p and state of affairs q, but state of affairs p is just that state of affairs which is characterized by pursuance of the course of action designated by the English expression represented by 'p' in the R-expression 'pRq'. Negation is symbolized by '∼', conjunction by '&', material implication by '→', material equivalence by '↔', inclusive disjunction by 'v', and exclusive disjunction by '*v*'.

That someone would rather p than q entails that he supposes it logically possible to choose between p and q. That is, that 'pRq' is true of S entails that S supposes the situation logically possible in which he can or must choose between p and q. A situation in which S is faced with the choice between p and q may be represented symbolically as the unsolved exclusive disjunction p*v*q. It is easily shown that a choice situation representable by the expression 'p*v*q' must also be representable by the expression '(p&∼q) v (∼p&q)', the transformation being accomplished by performing distribution on the expression '(pvq) & ∼(p&q)' to which the expression 'p*v*q' is materially equivalent by definition. Thus, that there is an entailment relation between 'S would rather p than q' and 'S supposes that a choice situation p*v*q is logically possible', itself entails that there is an entailment relation between 'S would rather p than q' and 'S supposes that p without q is possible and that q without p is possible'. That both, and not just one of these suppositions is entailed is a consequence of the fact that p*v*q is an unsolved disjunction. A consequence of the fact that p*v*q is an exclusive disjunction is that, that S would rather p than q entails that S supposes that there is no entailment relation between p and q. I shall assume that S knows the meanings of the terms that define his choice situations. It is then the case that, that p entails q or that q entails p, itself entails that the R-expression 'pRq' is inconsistent, since the choice situation p*v*q is not possible. Thus, for S the preference expressed in 'I would rather be Red than alive' does not occur.

The exclusive disjunctive expression 'pvq' as used here differs from the disjunction of the propositional calculus in a number of ways, the most important of which is the following. Whereas the solution of a disjunction of the propositional calculus takes the form of a proposition that is true, the solution of the disjunction pvq takes the form either of an action or of a decision to act; S solves the disjunction pvq by following or resolving to follow one or the other of p and q, by making a choice between p and q. I shall use the expression 'choice description' to designate those descriptions of choices which are of the form 'S x's rather than y'. I shall introduce the operator '$\#$' to designate the resolution of a choice situation. The expression '$p\#q$' (read 'p sharp q') represents the English statement to the effect that someone follows course of action p rather than follow course of action q. '$p\#q$' is defined as the resolution of the choice situation pvq in favour of p. The relation designated by '$\#$' has important similarities with the relation designated by '$\&\sim$', the truth of '$p\&\sim q$' being a necessary though not sufficient condition for the truth of '$p\#q$'. It is a necessary condition of an instance of $p\&\sim q$ being an instance of $p\#q$, that the instance of $p\&\sim q$ also be an instance of the resolution of the choice situation pvq. This is simply a reflection of the following fact: we do not say, just because a man went to work and did not murder his wife, that the man went to work rather than murder his wife.

Since the choice situation pvq is materially equivalent to the choice situation $(p\&\sim q)v(\sim p\&q)$, resolution of the choice situation pvq in favour of p is materially equivalent to the resolution of the choice situation $(p\&\sim q)v(\sim p\&q)$ and therefore, $p\#q\leftrightarrow(p\&\sim q)\#(\sim p\&q)$. That is, choice is conjunctively expansible.

I shall turn now to an examination of some of the ways in which P-preference, R-preference and choice are interrelated. In doing this, I shall make use of certain technical distinctions, first between two different forms of descriptions of human action, and secondly between two different forms of explanations of human action. A description of the form 'S did x' will be called a *unal description* of the action x. A description of the form 'S did x rather than y' or 'S did x instead of y' will be called a *dual description* of the action x. The relevant difference between a unal description and a dual description is that the latter mentions a second action as well as the one being described. An action that comes under a unal description may or may not come under a dual but an action that comes under a dual description also comes under a unal description. '$p\#q$' is a particular dual description of the action p. Secondly, explanatory assertions that involve mention of only one action will be labelled *unal explanations*. 'I enjoy doing x' can be a unal explanation. Explanatory assertions that involve mention of two actions will be called *dual explanations*. 'I enjoy doing x more than y' can be a dual explanation.

Besides making use of these two technical distinctions, I shall make some use of the word 'implies'. The sense in which I shall use it is not so much a technical sense as one of the several senses in which it is used in ordinary speech. However, it will be as well to state at the outset precisely the sense that it will have. I shall say that the utterance 'p' implies that q if and only if all of the following conditions are fulfilled:

(*a*) 'p' has been uttered.

(*b*) the utterance of 'p' was intended by the speaker to have a certain function f.

(*c*) that the utterance of 'p' can have the function f entails that q. For example, suppose that 'p' is uttered in explanation of action x. That 'p' can be an explanation of action x entails that q is the case. Then the utterance 'p' implies that q. The implicant is always an utterance; the implicate is always a statement.

Preferences play a special role in the explanation of choices. P. H. Nowell-Smith has maintained that preferences provide logically complete explanations of choice, that 'it is logically odd to say: "I know you prefer peaches, but why did you choose the peach?"' (*Ethics*, ch. 7). In the following, my concern will not be with the completeness or incompleteness of the explanations that preferences provide, but with the necessary conditions of preferences providing explanations at all.

A single set of physical movements may come under more than one unal description. A man who is waving his arms may be warning a friend, or flagging down a passing automobile, or exercising, or simply waving his arms. Here the description that we give to his action depends upon our knowledge of his reasons for, or his intentions in waving his arms. We would say, 'He's *not just* waving his arms; he's warning his friend' or 'he's exercising', thereby indicating that the characterization of his action as waving his arms an incomplete account of what he is doing. The account is incomplete because if does not reveal the man's intention in going through the physical movements that he is going through. But there is a second way in which a description or an action can be incomplete. We give an incomplete description of an action when we give a unal description to an action that comes under a dual description. Here the incompleteness is of a different sort. That is, it is not incomplete because it fails to reveal intentions. If a man takes a peach rather than an orange, and we characterize his action as taking a peach, our characterization is incomplete as a characterization of his action, but not necessarily because it fails to reveal his intention in taking the peach. His intention may have been just to take the peach.

The sort of explanation appropriate to an action that comes under a unal description depends upon the sort of unal description that the action comes under. We would be prepared to accept 'I like exercising' as an explanation of a person's waving his arms where his waving his arms is exercising. We would be less inclined to accept 'I like warning my friends' as an explanation of a person's waving his arms where his waving his arms is an instance of warning his friends. Our reason for not accepting this as an explanation of his action would not be the logical reason that this is not the sort of thing that could be an explanation of his action. It would be the non-logical reason that we did not think that he was telling the whole truth, or that he was evading the question. It is, however, a matter of logic that explanations that are appropriate to actions that come under only a unal description, cannot provide explanations of actions that in fact come under dual descriptions. The difficulty is not that they do not provide complete explanations, but that they do not provide explanations at all. When offered as an explanation of doing x rather than y, 'x has property i' can be successful only if it implies that y does not have property i. If it is explicitly denied that y lacks property i, then 'x has property i' ceases to be an explanation of doing x rather than y. That is, if someone says in response to the question 'Why did you do x rather than y', 'x has property i, but of course, so does y', the force of this must be to indicate that x's having property i is not part of the explanation of his doing x rather than y. Similarly, if S says 'I did x rather than y because I like doing x', it is implied that it is false that he likes doing y. That the statement 'I like doing x' can be an explanation of doing x, entails either that his doing x was not an instance of doing x rather than y, or that it is not true that he likes y. This can be summed up in this way: an action that comes under a dual description demands a dual explanation. That this is so becomes more evident by consideration of the following set of facts: 'I did x rather than y' is an acceptable answer to the question 'Why did you do x?' As an answer to this question, 'I did x rather than y' would, corresponding to two ways of substituting for 'x' and 'y', have one or the other of two forces. We can substitute values for 'x' and 'y' in such a way that not doing x involves either logically or non-logically doing y, or we can substitute values for 'x' and 'y' such that not doing x involves neither logically nor non-logically doing y. Where substitutions have been made in the former way, the answer 'I did x rather than y' would have the function of explaining the action by citing the intention to avoid doing y. But if substitutions have been made in such a way that not doing x involves, neither logically nor non-logically, doing y, the reply 'I did x rather than y' can only function as an indication of the sort of explanation that is possible, and therefore of the sort of question that should be asked.

The converse of the rule that actions that come under dual description require dual explanation is also true. That is, dual explanations can be explanations only of actions that come under dual description. As an answer to the question 'Why did you do x?', the reply 'I like x more than y' implies that the action comes under a dual description, specifically, that the action was an instance of doing x rather than y.

Thus, if P-preferences and R-preferences are to play any part in the explanations of actions, they will play a role in the explanation of actions that come under dual descriptions. For this reason, preferences hold a special, if not unique explanatory relation to choices. There follows an examination of the ways in which P-preferences and R-preferences function in explanations of actions that come under the specific dual description 'S does x rather than y'.

The difference between the role of R-preference and the role of P-preference in the explanation of actions under dual descriptions is analogous to the difference between the roles of wants and likes in the explanation of actions that come under unal descriptions only. Consider the following set of questions and answers:

Q_1: 'Why did you do x?'
A_{1a}: 'Because I wanted to do x'
A_{1b}: 'Because I like doing x'
Q_2: 'Why did you do x rather than y?'
A_{2a}: 'Because I would rather do x than y'
A_{2b}: 'Because I like doing x more than doing y'

Answer A_{1a} does not provide an explanation of doing x, although it indicates that there is an answer of the sort expected, that is, an answer specifying ones reasons for doing x. Similarly, answer A_{2a} does not provide an explanation of doing x rather than y, although it indicates that there is an explanation of a certain sort for doing x rather than y. The reason why A_{1a} does not provide an explanation of doing x, is that if it is known that A_{1a} is the case, then the question Q_1 has precisely the force of the question 'Why did you want to do x?' in the sense that it demands precisely the same answer. Answer A_{2a} fails as an answer to question Q_2 for the similar reason that once it is known that A_{2a} is the case, the answer demanded by the question 'Why did you do x rather than y?' Is precisely the answer that would be demanded by the question 'Why would you rather do x than y?'. If I answer the question 'Why did you want to do x?' by citing my reasons for wanting to do x, then if I did x, then the answer to that question is also the answer to the question 'Why did you do x?' My reasons for wanting to do x are my reasons for doing x. Similarly, the reasons why I would rather do x than y are my reasons for doing x rather than y.

Answer A_{1b} provides an answer to question Q_1, and answer A_{2b} provides an answer to question Q_2. This is to say that liking to do x provides a reason for and an explanation of our doing x, and that liking doing x more than doing y provides a reason for and an explanation of our doing x rather than y.

Thus the relation between liking to do x and doing x is different from the relation between wanting to do x and doing x. There is a parallel difference between the relation between having a P-preference of doing x to doing y and doing x rather than y, and the relation between having the R-preference (do x) R (do y) and doing x rather than y. Our likes provide reasons for and explanations of both our wants and our actions. Our P-preferences provide explanations of both our R-preferences and our choices.

That we do x is a sign that we want to do x; that we do x rather than y is a sign that we would rather do x than y. Only if it is true both that we do x and that we want to do x can our doing x be explained by our liking to do x. Only if it is true both that we do x rather than y and that we would rather do x than y can our doing x rather than y be explained by our P-preference of doing x to doing y. Since R-preferences are essentially preferences that are explicable by citing reasons, and the reasons for our R-preferences are reasons for choosing consistently with our R-preferences, therefore that there is the preference pRq entails that there are reasons for $p \# q$.

There remains now only to make two brief points about the conclusion, and then to say what the conclusion is. The first

point is that the formula '$p\not\#q \leftrightarrow (p\&{\sim}q)\not\#({\sim}p\&q)$' *reflects* the property of conjunctive expansibility, but does not state it. The fact that choice is conjunctively expansible is the fact that there would be mutual entailment between propositions expressed by
the sentences represented by '$p\not\#q$' and '$(p\&{\sim}q)\not\#({\sim}p\&q)$'. The material implications and equivalences that I shall mention in the conclusion are material implications and equivalences that obtain in virtue of choice and R-preference having certain properties. When I postulate that $p\not\#q$ materially implies $X\not\#Y$, this is taken to exclude the possibility of a material implication in virtue of the truth of $X\not\#Y$ or the falsity of $p\not\#q$.

The second point concerns the 'certain set of logical properties' mentioned at the outset of the paper. R-preference would have a property of this sort if and only if there were mutual entailment between propositions expressed by sentences represented by R-expressions R_1 and R_2, where R_2 contains no variables that are not contained in R_1. Thus, for example, the properties of transitivity and asymmetry are excluded from consideration, and the properties affecting distribution over truth-functional connectives are included as well as the property of conjunctive expansibility.

We are now in a position to prove that any properties of this sort that are properties of choice are also properties of R-preference. The proof is straightforward. The preference pPq cannot provide an explanation of $p\not\#q$ unless pRq is also the case. Postulate that $p\not\#q$ is explained by pPq. Then pRq is the case. Postulate that $p\not\#q$ materially implies $X\not\#Y$ (in virtue of a certain property of choice). Then making the choice $p\not\#q$ is (in part at least) making the choice $X\not\#Y$. Then pPq provides an explanation of $X\not\#Y$, and therefore XRY is also the case. That is, when $(p\not\#q)\rightarrow(X\not\#Y)$ is the case, then $(pRq)\rightarrow(XRY)$ is also the case. It is a condition of the explicability of $p\not\#q$ by reference to pPq that pRq materially imply the R-preference with which a choice materially implied by $p\not\#q$ is consistent. Here 'consistent choice' means 'the choice whose description is obtained by replacing "R" by "$\not\#$" in the atomic R-expression'. It is therefore a condition of the explicability of $p\not\#q$ by reference to pPq that $(pRq)\rightarrow(p\&{\sim}q)\,R\,({\sim}p\&q)$ and that $(p\&{\sim}q)\,R\,({\sim}p\&q)\rightarrow(pRq)$, that is, that $(pRq)\leftrightarrow(p\&{\sim}q)\,R\,({\sim}p\&q)$, that is, that R-preference be conjunctively expansible.

The purpose of this paper has not been just to show the conjunctive expansibility of R-preference, but to show the correlation that permits this property and any other property of the sort outlined above that is a property of choice, to be shown to be a property of R-preference. It has not been necessary for my purposes to give a complete formal account of preferences; I have simply outlined some interrelations among P-preferences, R-preferences, and choice,. But these are interrelations that any logic of preference must take into account in order to be complete.

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